Vol. 1010 Number 3

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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September 15, 1981

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Patent and Trademark Office

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September 15, 1981 Volume 1010 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,780,497, Re. S.N. 269,822, Filed June 2, 1981, Cl. 55/71, ADSORPTION OF FLUORINE AND FLUORINE COMPOUNDS ON ALUMINA, Wolf Muhlrad, Owner of Record: *Air Industrie, Courbevoie, France,* Attorney or Agent: John T. Synnestvedt, et al., Ex. Gp.: 177

4,022,262, Re. S.N. 267,954, Filed May 28, 1981, Cl. 411/302, SEALING LOCKNUT, Donald J. Gunn, Owner of Record: *Crouse-Hinds Co., Syracuse, New York,* Attorney or Agent: Richard C. Sughrue, et al. Ex. Gp.: 355

4,139,784, Re. S.N. 269,520, Filed June 1, 1981, Cl. 307/221D, CCD INPUT CIRCUITS, Donald Jon Sauer, Owner of Record: *RCA Corp., Princeton, N.J.,* Attorney or Agent: Samuel Cohen, et al., Ex. Gp.: 254

4,152,831, Re. S.N. 266,625, Filed May 22, 1981, Cl. 30/231, TOOL HOLDER, Peter O. Davies, Owner of Record: *Tullen Industries Ltd., Auckland, New Zealand,* Attorney or Agent: John Clark Holman, et al., Ex. Gp.: 323

4,155,735, Re. S.N. 264,771, Filed May 18, 1981, Cl. 65/30E, ELECTROMIGATION METHOD FOR MAKING STAINED GLASS PHOTOMASKS, Fred M. Ernsberge, Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: Dennis G. Millman, Ex. Gp.: 173

4,156,193, Re. S.N. 265,432, Filed May 20, 1981, Cl. 455/76, CRYSTALLESS SCANNING RADIO RECEIVER AND TRANSMITTER, William Baker, Owner of Record: *Masco Corp., of Indiana, Cumberland, Ind.,* Attorney or Agent: Sidney Neuman et al., Ex. Gp.: 233

4,156,433, Re. S.N. 267,430, Filed May 26, 1981, Cl. 135/4R, PORTABLE SHELTER, Bryan J. Beaulieu, Owner of Record: *Inventor,* Attorney or Agent: Orrin M. Haugen, Ex. Gp.: 354

4,175,277, Re. S.N. 265,039, Filed May 18, 1981, Cl. 361/120, VOLTAGE SURGE PROTECTOR, Paul Zuk, Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 212

4,207,976, Re. S.N. 268,745, Filed June 1, 1981, Cl. 206/246, CIGARETTE PACKAGE, Rodney W. Herman, Owner of Record: *Inventor,* Attorney or Agent: John D. Gould, et al., Ex. Gp.: 241

4,213,793, Re. S.N. 266,631, Filed May 26, 1981, Cl. 106/286.8, PROCESS FOR DESULFURIZATION OF COAL AND ORES, Arthur E. Starbuck, Owner of Record: *Inventor,* Attorney or Agent: Theodore, J. Bielen, Jr., et al., Ex. Gp.: 142

4,253,691, Re. S.N. 267,062, Filed May 26, 1981, Cl. 294/1.21, PET LITTER REMOVER AND BAGGER, William Y. Liu, Owner of Record: *Inventor,* Attorney or Agent: Robert L. Slater, Jr., Ex. Gp.: 313

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,464,799, Reexam. No. 90/000,043, Requested: Aug. 3, 1981, Cl. 422/91, GAS DETECTOR, Charles L. Kimbell, Owner of Record: *Inventor,* Attorney or Agent: Harold Levine & Alfred Hall, Ex. Gp.: 173, Requester: Robert W. Canterbury, Crisman & Moore, Dallas, Tex.

3,521,412, Reexam. No. 90/000,058, Requested: Aug. 20, 1981, Cl. 51/317, METHOD OF HONING BY EXTRUDING, Ralph W. McCarty, Owner of Record: *Extrude Hone Corp.,* Attorney or Agent: Baldwin, Egan, et al., Ex. Gp.: 323, Requester: Dynetics Corp., c/o Richard Stevens, Boston, Mass.

3,808,340, Reexam. No. 90/000,057, Requested: Aug. 17, 1981, Cl. 426/92, MEAT COATED PRODUCT, Hugh C. Palmer, Owner of Record: *Kal Kan Foods Inc.,* Attorney or Agent: Davis, Hoxie, Faithfull & Hapgood, Ex. Gp.: 172, Requester: Kal Kan Foods, Inc., Vernon, Calif.

3,850,752, Reexam. No. 90/000,056, Requested: Aug. 14, 1981, Cl. 435/7, PROCESS FOR THE DEMONSTRATION AND DETERMINATION OF LOW MOLECULAR COMPOUNDS AND OF PROTEINS CAPABLE OF BINDING THESE COMPOUNDS SPECIFICALLY, Antonius Hermanus Wilhelmus Maria Schuurs, Bauke Klass Van Weemen, Owner of Record: *Akzona Inc.,* Attorney or Agent: Robert H. Falk, Esq., Ex. Gp.: 176, Requester: Akzona Inc., Asheville, N.C.

3,964,405, Reexam. No. 90/000,055, Requested: Aug. 14, 1981, Cl. 111/6, PERENNIAL WEED CONTROL BY DEEP PLACEMENT OF VOLATILE SOIL FUMIGANTS, William A. Haglund & Theodore P. Reiling, Owner of Record: *Inventors,* Attorney or Agent: Roy E. Mattern Jr., Ex. Gp.: 330, Requester: David R. Murphy, Quaintance & Murphy, Arlington, Va.

Vacancy Announcement
Chairman, Trademark Trial and Appeal Board

In accordance with the Senior Executive Service, the position of Chairman of the Trademark Trial and Appeal Board is being advertised. This appointment will be made at a salary of $50,113 per annum, which is the current statutory limit before awards and bonuses are distributed.

Persons interested in being considered for the vacancy, PTO-81-112, are invited to submit their applications to the address given below, on or before Sept. 30, 1981. Applications must be in the Office of Personnel by Sept. 30, 1981. The duties, qualifications, and factors which will be considered in evaluating the candidates are described below.

Duties: Serves as Chairman, Trademark Trial and Appeal Board. Manages the administrative functions of the Board and supervises the technical work of the Board. As a member of the TTAB, exercises original jurisdiction in *inter partes* proceedings and appellate jurisdiction of *ex parte* appeals. Renders written decisions representing the position of the PTO.

Qualifications: Evaluation of qualified candidates will be on the basis of education (self-development), awards, supervisory performance appraisals, managerial/executive qualifications and technical/professional qualifications. Candidates should address all these qualifications in their supplemental statements. Copies of the Qualification Standard are available in Crystal Plaza 2, Room 9C05.

Factors Which Will be Considered in Evaluating Qualified Candidates:

The six managerial/executive factors for SES positions are:

1. Integration of internal and external program policy issues;
2. Organization representation and liaison;
3. Direction and guidance of program, projects or policy development;
4. Resource acquisition and administration;
5. Utilization of human resources;
6. Review of implementation and results.

The technical/professional qualifications are:

1. Law degree and bar membership;
2. Professional legal experience which has provided a comprehensive knowledge of Appellate matters in Trademark law, rules of evidence, the Federal Rules of Civil Procedures, and general principles of ancillary legal subjects;
3. Demonstrated ability to express thoroughlv, clearly and accurately the material facts, legal principles and reasons for arriving at a stated conclusion by the application of law to the facts.

Employees of the Department of Commerce may apply by submitting a Merit Program Interest Statement (CD-261), OPM Form 1386, current performance appraisal, updated Personal Qualifications Statement (SF-171) and supplemental statement showing how the qualifications are met. Persons who are not employees of the Department of Commerce should submit a current performance appraisal, Personal Qualifications Statement (SF-171), OPM Form 1386, and supplemental statement. The completed forms should be sent to:

U.S. Patent and Trademark Office
Office of Personnel
Crystal Plaza 2, Room 9C05
2011 Jefferson Davis Hwy.
Arlington, Va. 22202

Questions concerning this notice should be directed to Ms. Marilyn Gannon, Office of Personnel, Room 2-9C05, Telephone (703) 557-3631.

July 27, 1981.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 15, 1981

D. 259,484	4,245,088	4,261,809	4,272,051
D. 259,524	4,245,850	4,262,460	4,272,717
3,769,775	4,247,906	4,262,633	4,273,132
4,022,889	4,248,620	4,262,844	4,273,230
4,027,021	4,250,443	4,263,247	4,273,513
4,066,779	4,250,815	4,263,428	4,273,601
4,115,433	4,251,492	4,263,899	4,273,608
4,148,406	4,251,616	4,264,266	4,273,718
4,168,810	4,252,554	4,265,271	4,273,772
4,173,553	4,252,920	4,265,641	4,273,904
4,177,446	4,254,000	4,265,668	4,273,909
4,179,196	4,254,381	4,265,866	4,273,976
4,190,283	4,254,463	4,267,761	4,274,320
4,191,774	4,254,512	4,267,801	4,274,391
4,197,797	4,255,708	4,268,545	4,274,522
4,208,650	4,256,550	4,268,820	4,274,541
4,210,287	4,256,927	4,268,843	4,274,579
4,211,879	4,257,087	4,269,005	4,274,781
4,212,088	4,257,198	4,269,198	4,275,077
4,216,135	4,257,614	4,269,589	4,275,082
4,221,564	4,257,878	4,269,700	4,275,319
4,221,565	4,258,126	4,269,717	4,275,334
4,221,764	4,258,401	4,269,811	4,275,452
4,226,836	4,258,577	4,269,956	4,275,567
4,230,550	4,258,579	4,270,065	4,275,600
4,235,354	4,258,649	4,270,164	4,275,771
4,235,962	4,258,677	4,270,202	4,276,198
4,238,281	4,258,711	4,270,300	4,276,220
4,238,629	4,259,224	4,270,407	4,276,237
4,241,029	4,259,228	4,270,489	4,276,243
4,241,132	4,260,148	4,270,841	4,276,283
4,241,960	4,260,225	4,270,864	4,276,434
4,241,994	4,260,464	4,271,084	4,276,554
4,243,542	4,260,591	4,271,313	4,276,713
4,243,721	4,261,261	4,271,318	4,276,784
4,243,746	4,261,292	4,271,364	
4,244,180	4,261,304	4,271,497	
4,244,297	4,261,673	4,271,678	

Disclaimers

3,822,119.—*Kenneth J. Frech,* Tallmadge and James J. Tazuma, Stow, Ohio. ANTI-POLLUTION ANTI-KNOCK GASOLINE. Patent dated July 2, 1972. Disclaimer filed July 8, 1981, by the assignee, *The Goodyear Tire & Rubber Co.*

Hereby enters this disclaimer to claims 1 through 9 of said patent.

3,911,774.—*Lewis F. Jennings, McHenry, and Kenneth W. Bower,* Des Plaines, Ill. POWERED ADJUSTABLE TRIMMER CONSTRUCTION. Patent dated Oct. 14, 1975. Disclaimer filed July 16, 1981, by the assignee, *Uarco Inc.,*

Hereby enters this disclaimer to claim 1 of said patent.

3,999,386.—*Stanley W. Crull and Donald J. MacIntosh,* Ames, Iowa. OVERSPEED PROTECTION CONTROL FOR AN ENGINE. Patent dated Dec. 28, 1976. Disclaimer filed June 22, 1981, by the assignee, *Sundstrand Corp.,*

Hereby enters this disclaimer to claim 3 of said patent.

4,067,591.—*Harry Celms,* Battle Creek, Mich. BASE FOR NESTABLE SHOPPING CART. Patent dated Jan. 10, 1978. Disclaimer filled July 14, 1981, by the assignee, *Roblin Industries, Inc.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6 and 14 of said patent.

4,152,235.—*John V. Dobson,* Hartlepool, England. ION SELECTIVE ELECTRODE. Patent dated May 1, 1979. Disclaimer filed June 29, 1981, by the assignee, *National Research Development Corp.*

Hereby entes this disclaimer to claims 1–17, inclusive of said patent.

4,178,843.—*Hugh F. Groth; Guilbert M. Hunt,* Brecksville, *Thomas E. Lipinski;* Bath; and *Anthony D. Szpak,* Parma, Ohio. PORTABLE CORN POPPER. Patent dated Dec. 18, 1979. Disclaimer filed Feb. 17, 1981, by the assignee, *Wear-Ever Aluminum, Inc.*

Hereby enters this disclaimer to claim 4 of said patent.

4,182,468.—*Griffith L. Hoerner,* Santa Monica, Calif. COMBINED CLOSURE AND RUMBLE SEAT FOR AUTOMOBILES. Patent dated Jan. 8, 1980. Disclaimer filed June 29, 1981, by the inventor.

Hereby enters this disclaimer to claims 4–9 inclusive of said patent.

4,219,422.—*Erich Knothe, Bovenden and Gerhard Lorenz, Krebeck,* Germany. APPARATUS FOR MASS TRANSFER BETWEEN FLUIDS, PROVIDED WITH AN INTERPOSED SELECTIVELY PERMEABLE DIAPHRAGM UNIT. Patent dated Aug. 26, 1980. Disclaimer filed July 6, 1981, by the assignee, *Sartorius GmbH.*

Hereby enters this disclaimer to claim 11 of said patent.

4,251,540.—*Erik Regel; Wilfried Draber and Karl H. Buchel, Wuppertal, Peter Kraus, Koeln, and Wilhelm Brandes, Leichlingen,* All of Fed. Rep. of Germany. COMBATING CROP DAMAGING FUNGI WITH ALPHA-(4-BIPHENYLYL)-BENZYL-AZOLIUM SALTS. Patent dated Feb. 17, 1981. Disclaimer filed Mar. 5, 1981, by the assignee, *Bayer Aktiengesellschaft.*

The term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE ARMY/OTJAG
Chief, Intellectual Property Division
Room 2D 444, Pentagon
Washington, D.C. 20310

Patent application 6-175,541. Method for Detecting the Presence of a Gas in an Atmosphere. Filed Aug. 5, 1980.

Patent application 6-192,669. High Altitude Platform Air Drop System. Filed Oct. 1, 1980.

Patent application 6-198,322. Laser Doppler Attitude Measurement. Filed Oct. 20, 1980.

Patent application 6-200,664. High Peak Power, High PRF Laser System. Filed Oct. 27, 1980.

Patent application 6-201,678. Two-Degree-of-Freedom Gyro with Radiant Energy Pickoffs. Filed Oct. 29, 1980.

Patent application 6-202,811. Method and Device for Producing Nuclear Fusion. Filed Oct. 31, 1980.

Patent application 6-204,744. Flow Compensated Gas Comparison Probe. Filed Nov. 7, 1980.

Patent application 6-216,232. High Speed Rectangle Function Generator. Filed Dec. 15, 1980.

Patent application 6-216,417. Switch Actuator. Filed Dec. 15, 1980.

Patent application 6-217,361. Optical Dosimeter. filed Dec. 17, 1980.

Patent application 6-217,890. Domed Environmental Protective Cover for Rocket Systems. Filed Dec. 18, 1980.

Patent application 6-218,597. Rocket Motor Igniter for Precision Centroid of thrust. Filed Dec. 19, 1980.

Patent application 6-220,474. Hypersonic Wedge Nozzle for Chemical Lasers. Filed Dec. 29, 1980.

Patent application 6-224,603. Thyratron Switch for Narrow Pulses. Filed Jan. 12, 1980.

U.S. DEPARTMENT OF AGRICULTURE
Program Agreements and Patent Branch
Administrative Service Division Federal Building
Science & Education Administration
Hyattsville, Md. 20782

Patent 4,255,149. Abrasion Resistance and Strength of Cotton-Containing Fabric made Resilient with N-Methylolacrylamide-Type Reagent. Filed Jan. 31, 1979. Patented Mar. 10, 1981. Not available NTIS.

Patent 4,260,638. Method of Peeling Fruits and Vegetables with Carboxylic Acids. Filed Dec. 13, 1979. Patented Apr. 7, 1981. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
Chief, Patent Branch
Westwood Building
Bethesda, Md. 20205

Patent 4,262,194. High Resolution Electron Microscope Cold Stage. Filed Dec. 18, 1979. Patented Apr. 14, 1981. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Director, Navy Patent Program/
Patent Counsel for the Navy
Office of Naval Research
Code 302
Arlington, Va. 22217

Patent application 6-214,839. Rotating Squid Magnetometers and Gradiometers. Filed Dec. 10, 1978.

Patent application 6-224,711. Electronic Score Pad. Filed Jan. 12, 1981.

Patent application 6-232,444. Controlled Porosity Sheet for thermionic Dispenser Cathode and Method of Manufacture. Filed Feb. 6, 1981.

Patent 4,246,780. Force Sensing System. Filed Apr. 30, 1979. Patented Jan. 27, 1981. Not available NTIS.

Patent 4,252,285. Dynamic Seal for Slotted Cylinder. Filed Apr. 30, 1979. Patented Feb. 24, 1981. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters
NASA Code GP-4
Washington, D.C. 20546

Patent application 6-224,232. Dual Laser Optical System and Method for Studying Fluid Flow. Filed Jan. 12, 1981.

Patent application 6-229,239. A Cycling Joule Thomson Refrigerator. Filed Jan. 28, 1981.

Errata

"All reference to Patent No. Re. 30,681 to James L. Furlette of Florida and Donald A. Stadler of Michigan for TORQUE LIMITING COUPLING appearing in the Official Gazette of July 21, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,279,303 to Steven R. Erbstoesser of Texas for POLYURETHANE BALL SEALERS FOR WELL TREATMENT FLUID DIVERSION appearing in the Official Gazette of July 21, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,281,772 to Sheldon L. Wilde, Thomas J. McCandless and Robert M. Saunders all of Indiana for COMPOSITE CLOSURE appearing in the Official Gazette of August 4, 1981 should be deleted since no patent was granted."

"All reference to Patent No. 4,283,193 to Dietrich Hildebrand of Germany for PROCESS FOR DYEING CELLULOSE MATERIALS WITH REACTIVE DYESTUFFS BY THE EXHAUSTION METHOD appearing in the Official Gazette of August 11, 1981 should be deleted since no patent was granted."

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 25, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	4-29-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	6-25-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	7-11-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-03-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-07-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-03-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-31-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	6-08-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-28-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	11-01-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	2-06-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-30-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,139,622 to 3,142,840, inclusive

Plant Patents ..... Numbers 2,416 to 2,430, inclusive

REISSUES

SEPTEMBER 15, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,741

MINIATURIZED PRINTER CONTROL ASSEMBLY

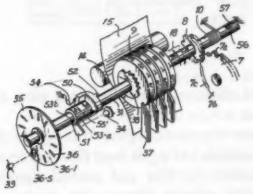
Norio Nakagaki, and Shigeru Sawada, both of Shiojiri, Japan, assignors to Shinshu Seiki Kabushiki Kaisha, Tokyo, Japan

Original No. 4,170,937, dated Oct. 16, 1979, Ser. No. 871,585, Jan. 23, 1978. Application for reissue Apr. 9, 1980, Ser. No. 138,611

Claims priority, application Japan, Jan. 24, 1977, 52/6524

Int. Cl.[3] **B41J** *1/44*

U.S. Cl. 101—99 **12 Claims**



1. In a printer including a plurality of print rings having print characters circumferentially disposed therearound, said print characters being selectively positioned in a print position by rotation of each of said print rings in a first rotational direction from a stand-by position to a print position during a print cycle and rotational drive means including motor means adapted, in response to being energized, to rotatably drive said print rings at least from said stand-by position to a print position during each print cycle, the improvement comprising a detection means for detecting the rotary position of said print rings and for generating a character selection timing pulse for each of the available rotational positions of each said print ring during each print cycle, said rotational positions of each of said print rings corresponding to a print character circumferentially disposed about said print rings, print selection means associated with each of said print rings for selectively positioning each of said print rings at respective predetermined print positions during each print cycle, in response to said character selection timing pulses produced by said detection means being applied thereto, said detection means being constructed and arranged to produce a stand-by signal representative of each print ring being returned to a stand-by position at the end of each print cycle, said detection means further including shutter means for preventing said detection means from producing said stand-by signal until a first predetermined interval of time after the last of said character selection timing pulses is generated in each print cycle.

Re. 30,742

CONTAINER DEPALLETIZING APPARATUS

Roman J. Weier, North St. Paul, Minn., assignor to Wyard Industries, Inc., Forest Lake, Minn.

Original No. 3,543,949, dated Dec. 1, 1970, Ser. No. 782,884, Dec. 11, 1968. Application for reissue Apr. 17, 1978, Ser. No. 897,298

Int. Cl.[2] **B65G** *59/02*

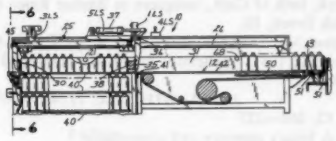
U.S. Cl. 414—119 **10 Claims**

1. Container depalletizing apparatus comprising:

a. lift mechanism for receiving a pallet therein having a plurality of tiers of containers stacked thereon and moving the pallet vertically approximately the height of a tier of containers to be depalletized;

b. conveying means operatively mounted adjacent the lift mechanism for receiving tiers of containers from pallets positioned in said lift mechanism and conveying them to a desired location;

c. sweep means mounted adjacent said lift mechanism for engaging at least a rear side of the tier of containers to be depalletized and urging said tier of containers onto said conveying means;



d. container restraining means having a tier engaging position for engaging the leading containers of the uppermost tier *and pushing said containers in the tier tightly together toward said sweep means* and a disengaged position; and

e. means connecting said restraining means to said sweep means for movement of said restraining means with said [seep] *sweep* means to prevent tipping of individual containers in said tier.

Re. 30,743

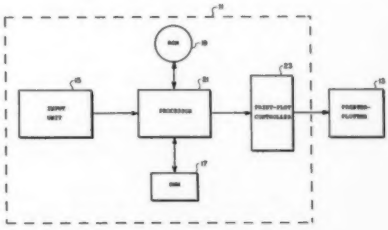
THERMAL PRINTER-PLOTTER SYSTEM FOR MULTI-DIRECTIONAL PRINTING AND PLOTTING

David J. Shelley, Corvallis, Oreg.; Rick A. Warp, San Diego, and Majid Azmoon, Poway, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Original No. 4,070,680, dated Jan. 24, 1978, Ser. No. 716,033, Aug. 20, 1976. Application for reissue Oct. 26, 1978, Ser. No. 955,069

Int. Cl.[3] **G01D** *15/10;* **H05B** *1/00*

U.S. Cl. 346—76 PH **12 Claims**



1. A system for forming visual output [manifestations] *images* on a web, comprising:

head means having a *non-linear* plurality of print elements engaging said web, each element being located at the intersection of first and second [coordinate positions] *coordinates of position* in the head, with no [element occupying] *two elements having* the same first coordinate [position] and no [element occupying] *two elements having* the same second coordinate [position];

drive means coupled to at least one of the web and the head means for providing relative motion [of] *between* the head means [with respect to] *and* the web along *at least one of the* two orthogonal coordinates *of the web*; and

logic means disposed to receive data and coupled to the drive means and to the *print elements of the* head means for forming visual output [manifestations] *images* on the

web in one of four directions along the two orthogonal coordinates *of the web* by causing the drive means to move at least one of the web and head means to a selected position *in selected steps* and energizing selected *print* elements of the head means to form selected portions of the visual output [manifestations] *images* in response to said data *at each position of the head means relative to the web.*

Re. 30,744

DIGITAL MEMORY APPARATUS

Robert H. Cole, Canoga Park, Calif.; Robert Feuer, Wayne, N.J.; Samuel Nissim, Malibu, and George V. Podraza, Canoga Park, both of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Original No. 3,518,635, dated Jun. 30, 1970, Ser. No. 662,457, Aug. 22, 1967. Application for reissue May 5, 1971, Ser. No. 140,541

Int. Cl.[3] **G11C** *7/00, 11/40*

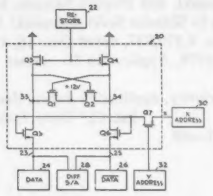
U.S. Cl. 365—227 **28 Claims**

1. A binary memory cell comprising:

first and second semiconductors each capable of being either forward biased or off biased;

means interconnecting said first and second semiconductors for holding said first semiconductor off biased in response to said second semiconductor being forward biased and for holding said second semiconductor off biased in response to said first semiconductor being forward biased;

data control means for selectively applying forward and off biasing binary data signals to said first and second semiconductors, said data control means including first and second complementary data signal sources and normally open first and second switches for respectively connecting said first and second semiconductors to said first and second data signal sources, each of said switches comprising a field effect transistor having a gate, a source, and a drain; and



a switch control means coupled to the gates of said first and second switches having at least first and second electrodes and responsive to first and second signals respectively concurrently applied thereto for closing said normally open switches.

PLANT PATENTS

GRANTED SEPTEMBER 15, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,766

EUONYMUS PLANT—CORDOLT VARIETY

Clifford D. Corliss, Ipswich, Mass., assignor to The Conard-Pyle Company, West Grove, Pa.

Filed May 19, 1980, Ser. No. 150,963

Int. Cl.[3] A01H *5/12*

U.S. Cl. Plt.—63 **1 Claim**

1. A new and distinct variety of *Euonymus fortunei* which is a branch mutation of the Emerald Gaiety variety, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of:

(a) a low and broad dense dwarf growth habit rendering the plant suitable for use as a mounding ground cover,

(b) smaller variegated leaves which when mature are deep green with ivory margins giving the overall plant an attractive silvery appearance when viewed from a distance,

(c) vigorous growth characteristics,

(d) the ability to thrive under a wide range of climatic conditions, and

(e) the ability to be sheared within prescribed limits or shaped to a specific form.

PATENTS

GRANTED SEP. 15, 1981

ERRATA

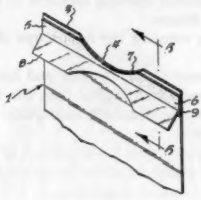
For CLASS	See PATENT NO.
411–451	4,289,058
411–531	4,289,059
411–034	4,289,060
411–034	4,289,061
411–034	4,289,062
411–187	4,289,181
277–027	4,289,264
369–072	4,289,316
164–122	4,289,570
518–714	4,289,709
518–717	4,289,710
164–503	4,289,946
430–270	4,290,075

PATENTS

GRANTED SEPTEMBER 15, 1981

GENERAL AND MECHANICAL

4,288,877
DISPOSABLE PROTECTIVE GARMENT
Harlan A. Klepfer, 16 Meadowstream Ct., Snyder, N.Y. 14226
Filed Dec. 14, 1979, Ser. No. 103,486
Int. Cl.³ A41B *27/12*
U.S. Cl. 2—48 **7 Claims**



1. A protective garment in the form of a bib, napkin or apron comprising a body of flexible sheet material having an upper edge,

a pressure-sensitive adhesive extending substantially continuously transversely across said garment at its upper portion,

said adhesive having a width extending downwardly from said upper edge for an appreciable distance,

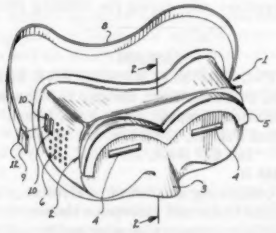
an overlay covering said pressure-sensitive adhesive and adapted to protect said adhesive from unwanted contact, and means for facilitating the removal of said overlay,

wherein said upper edge has a relatively shallow neck cutout portion at its central portion and shoulder pieces at either side of said neck cutout portion and wherein the width of said adhesive extends from slightly below said upper edge of said shoulder pieces to below said cutout portion,

wherein said overlay extends beyond said adhesive at said upper edge to facilitate removal of said overlay from said adhesive, and

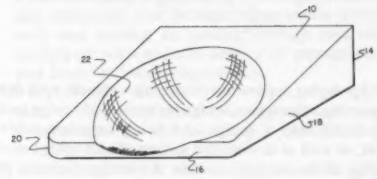
wherein the bottom edge portion of said overlay remains adhered to the bottom edge portion of said adhesive under normal conditions of use after removing said overlay from the remainder of said adhesive.

4,288,878
PAINTER'S PROTECTIVE DEVICE
Andrew J. Helmbreck, Mesa, Ariz., assignor to Russell C. Rogge, Scottsdale, Ariz., a part interest
Filed Feb. 23, 1979, Ser. No. 14,786
Int. Cl.³ A61F *9/02*
U.S. Cl. 2—427 **2 Claims**



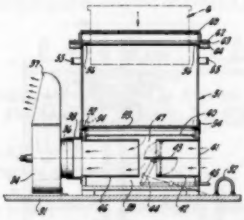
1. A painter's protective device comprising a mask adapted to cover the forehead, eyes and nose of a wearer and having eye holes, a visor integral with said mask and projecting outwardly from the forehead portion of the mask above the eye holes and curving downwardly centrally and at the ends to the sides of the mask and said eye holes, and means for retaining said mask on the wearer's head.

4,288,879
MATERNITY PILLOW
Johnny L. Pate, 514 N.E. 14th Ave., Cape Coral, Fla. 33904
Filed Sep. 6, 1979, Ser. No. 72,910
Int. Cl.³ A47G *9/00*; A61G *7/00*
U.S. Cl. 5—431 **1 Claim**



1. A pillow for support of the expanded abdomen of a pregnant woman while she is lying on one of her sides, comprising a substantially wedge-shaped resilient body having a front surface, a rear surface greater in height than said front surface, a pair of identical parallel side surfaces, a lower surface, and an upper surface with an elliptically shaped cavity which intersects said front surface to form a generally arc-shaped opening to said cavity in the plane of said front surface and which becomes progressively deeper along an axis parallel to said side surfaces in the direction of said rear surface.

4,288,880
BEE VACUUM DEVICE AND METHOD OF HANDLING BEES
Norman E. Gary, and Kenneth Lorenzen, both of Davis, Calif., assignors to The Regents of the University of California, Berkeley, Calif.
Filed Nov. 13, 1979, Ser. No. 93,587
Int. Cl.³ A01K *51/00, 57/00*
U.S. Cl. 6—12 R **4 Claims**



1. A device for removing bees from comb frames comprising a chamber having walls; means in one of said walls defining an elongated entrance opening of a configuration and size closely to receive the comb frame; vacuum means for subjecting the interior of said chamber to a subatmospheric pressure; and means for preventing the passage of bees from said chamber through said vacuum means, including a plate defining said entrance opening as a relatively narrow, elongated slot having substantially parallel sides, and in which said plate is supported by and removable from the top of said chamber.

4,288,881

BRIDGE LAYING APPARATUS

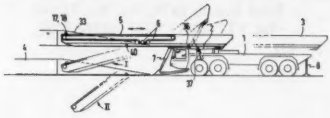
Jürgen Mahncke, Korntal; Hans Weigele, Stuttgart, and Dieter Hotz, Ditzingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 24, 1979, Ser. No. 87,865

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846182

Int. Cl.³ E01D *15/12*

U.S. Cl. 14—2.4 18 Claims



1. Bridge laying apparatus comprising a vehicle with devices for supporting at least two bridge sections, said bridge sections being joinable into a bridge and being superimposable for transport, as well as devices for joining of said bridge sections and laying of the bridge, wherein the bridge includes plural tracks connected to one another via crossbeams and the said devices are arranged and guided between said bridge tracks, characterized in that a laying beam with a launching girder releasably engaged therewith forms the laying device, said laying device being supported in a longitudinally displaceable manner via a guide means mounted to the vehicle and comprising roller pairs arranged on both sides of the launching girder, a respective one of these roller pairs serving for guiding and supporting the bridge on the laying beam and the other roller of the roller pairs serving for guiding and supporting the launching girder in the bridge, wherein said laying beam is displaceably attached to said vehicle, and wherein said launching girder is operable to remain with said bridge, upon disengagement of its releasable engagement with the laying beam.

4,288,882

ENDOSCOPE SHEATH CLEANING DEVICE

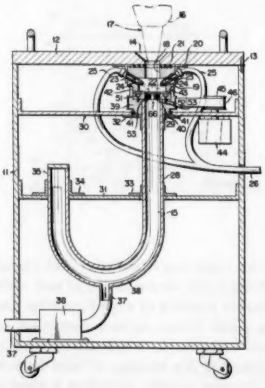
Haruo Takeuchi, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1980, Ser. No. 110,756

Claims priority, application Japan, Jan. 17, 1979, 54/4080

Int. Cl.³ B08B *9/02, 3/02;* A46B *13/04*

U.S. Cl. 15—88 15 Claims



1. An endoscope sheath cleaning device comprising:
a housing;
an upper plate covering the housing;
an insertion hole formed in the upper plate to allow for insertion of an endoscope sheath into the cleaning device;
a nozzle head disposed under the upper plate and having a lateral wall;
endoscope sheath cleaning means disposed under the nozzle head to resiliently contact a peripheral surface of an endoscope sheath inserted into the cleaning device through the insertion hole;
nozzles provided in the lateral wall of the nozzle head and each having a nozzle opening directed to the endoscope sheath cleaning means;
rotation means for rotating the endoscope sheath cleaning means;
a guide tube disposed in the housing and having two ends with one end positioned higher than the other end and aligned with the insertion hole, said guide tube having a lower portion; and
a drain tube connected to the lower portion of the guide tube for draining a washing liquid in the guide tube.

4,288,883

COMBINED TOOTH BRUSH AND GUM MASSAGING

Josef Dolinsky, Salzstr. 4, 8960 Kempten, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 78,390

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1978, 2847261

Int. Cl.³ A46B *9/04;* A61H *13/00*

U.S. Cl. 15—110 5 Claims

1. In a toothbrush comprising a handle portion and a head portion at one end thereof, the head portion having a plurality of longitudinally aligned rows of bristles, a plurality of longitudinal rows of massaging elements longitudinally straddling the rows of bristles, the improvement comprising the width of the plurality of rows of bristles approximating twice the height of a tooth whereby the toothbrush is limited to movement in a longitudinal direction only during the cleaning process.

4,288,884

MOP HAVING SKIP SLIT ABSORPTIVE ELEMENT

Jerold O. Bahls, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

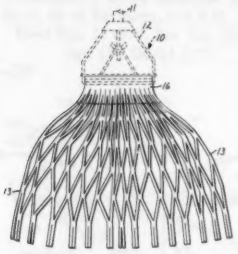
Filed Feb. 13, 1980, Ser. No. 121,008

Int. Cl.³ A47L *13/16, 13/20*

U.S. Cl. 15—244 R 8 Claims

8. In a mop comprising an absorptive element, a handle and a frame adapted to fasten said absorptive element to one end of said handle, the improvement characterized by said absorptive element comprising rectangular substantially flat strips of cellulose sponge material approximately 3 to 20 mm thick, each of said strips having a first portion capable of being fastened by said mop frame and opposed substantially equal drapable portions on either side of said first portion, wherein each of said drapable portions have an outer end opposite said first portion and are slit from said outer end toward but not into said

first portion to provide a pattern of spaced parallel disconnected slits throughout the drapable portion, with individual slits approximately 70 to 250 mm long and being spaced apart in the same row about 3 to 40 mm, and with adjacent parallel slits being approximately 3 to 16 mm apart and being off-set from one another to provide a lattice formed by side-by-side



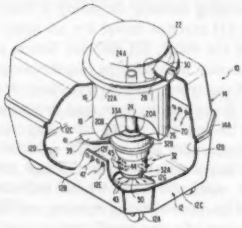
connected strips of said cellulose foam material, and a reinforcing web formed of a three-dimensional nonwoven lofty abrasive material partially embedded in one side of said first portion and being coextensive with said one side of said first portion and extending from drapable portion up to 130 mm of the distance from said first portion to said outer end.

4,288,885

HOT WATER VACUUM EXTRACTION MACHINE WITH REVERSE FAN COOLED VACUUM MOTOR

Carl Parise, Sparks, Nev., assignor to Parise & Sons, Inc., Sparks, Nev.

Filed Mar. 27, 1980, Ser. No. 134,732
Int. Cl.³ A47L *7/00*
U.S. Cl. 15—321 **4 Claims**



1. In a hot water vacuum extraction machine including:

an enclosed housing,

a dump bucket assembly vertically mounted within said housing and including an upright open ended dump bucket and an inverted cup-shaped cover sealingly fitted at its periphery to the top of said dump bucket,

a hose coupling projecting within said dump bucket assembly interior for returning by vacuum application to the interior of said dump bucket assembly, water and entrained dirt for separation from the air within said dump bucket,

an opening within the bottom of said dump bucket,

a riser tube sealably mounted to said dump bucket bottom and surrounding said opening and extending vertically within said dump bucket,

an electric motor driven vacuum pump assembly mounted vertically within said housing beneath said dump bucket, said vacuum pump assembly including:

an enclosed cylindrical housing having opposed upper and lower end walls and a cylindrical sidewall,

said upper end wall bearing a vacuum intake opening for sealable engagement with the bottom of said dump bucket riser tube,

a vacuum pump air discharge pipe extending from said casing cylindrical sidewall, through the interior of said vacuum extraction machine housing and opening to the exterior thereof,

cooling air flow ports within said housing, cooling air flow ports within said casing cylindrical side-wall intermediate of said ends, and cooling air passage means within the lower end wall of said vacuum pump assembly casing,

an electric motor mounted within said casing including fixed motor coils and a rotor mounted via a rotor shaft for rotation about a vertical axis and bearing at one end of said shaft adjacent the lower end wall of said casing, a fan for causing forced air flow through the interior of said casing and over the motor coils within said casing, with said cooling air passing through said sidewall cooling air ports and said cooling air passage means of said lower end wall, respectively,

the improvement wherein:

said vacuum pump assembly casing end wall comprises an annular shroud including a cylindrical shroud sidewall surrounding said fan,

said fan mounted to said vertical axis shaft includes a plurality of fan blades which extend radially within said annular shroud and terminate just short of said shroud sidewall and form a minimal air gap therebetween with said shroud annular sidewall and said blades being of such pitch and the direction of rotation of said motor being such that air flow is forced downwardly through said cylindrical casing of said vacuum pump assembly, over said motor windings for discharge through the lower end of said shroud annular wall, with said cooling air required to enter said housing through said cooling air ports within said hot water vacuum extraction machine housing and through the openings within said cylindrical casing sidewall of said vacuum pump assembly prior to discharge from the bottom of said vacuum pump assembly casing, whereby, the cooling air is warmed and dried prior to entering the ports of said vacuum pump assembly cylindrical casing sidewall and in exiting causes a blowing effect to disperse any water underlying the lower end of said vacuum pump assembly casing, and wherein the minimal gap between the tips of the fan blades and the shroud cylindrical sidewall functions to reduce air turbulence with a subsequent reduction in the production of heat in this area due to recirculation of exhaust air.

4,288,886

AIR BROOM

Frederick Siegler, 444 S. Citrus, Los Angeles, Calif. 90036

Filed Aug. 23, 1979, Ser. No. 65,996
Int. Cl.³ A47L *5/24*
U.S. Cl. 15—330 **8 Claims**

1. An air broom system comprising:

a housing,

a portable power unit in said housing and having a rotary power output with a longitudinal axis of rotation,

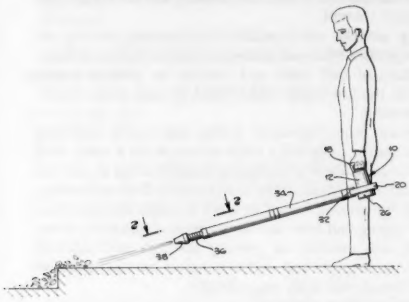
a rotary air impeller in said housing connected to said power output for rotation thereby,

said housing having an air inlet and an air outlet in flow communication with said air impeller,

an elongated tubular wand having an end in flow communication with one of said inlet and outlet of said housing and extending outwardly therefrom,

said housing having a carrying handle at an upper portion thereof and from which the housing with said power unit and air impeller, and said elongated tubular wand are suspended with the longitudinal axis of rotation of the motor generally upright, the weight of the housing, power

unit and air impeller, as an entirety, relative to the weight and leverage of the outwardly extending tubular wand, being such that the wand extends outwardly and downwardly toward the ground and terminates close to, but



above the ground when the air broom system is held by the handle in operation by a standing person,

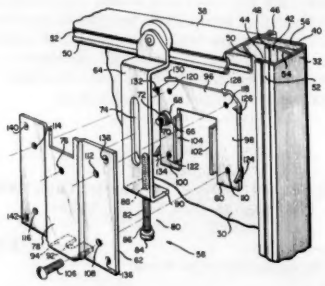
said handle and wand being distinctly separate and extending from opposite ends of the housing along the rotational axis of said motor.

4,288,887

FRAME CORNER CONNECTOR

Larry K. Johnson, and Kenneth L. Gates, both of Sterling, Ill., assignors to Lawrence Brothers, Inc., Sterling, Ill.

Filed Nov. 19, 1979, Ser. No. 95,421
Int. Cl.³ A47N *15/00*; E05D *13/02*
U.S. Cl. 16—105 **13 Claims**



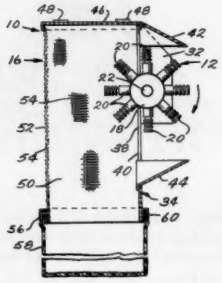
1. A corner connector for use with framed sections disposed at right angles and interconnected to form a corner joint, said frame sections having a flange projecting inwardly relative to said corner joint, and having an enlarged lip along the free edge thereof, said corner connector comprising: a first clamp section; a second clamp section superposed with said first clamp section and including indenting means protruding toward said first clamp section; means for engaging said flange interjacent said first clamp section and said second clamp section; whereby said indenting means will bear against and bitingly engage said flange and span the enlarged lip thereby rigidly connecting said frame sections.

4,288,888

DEVICE FOR REMOVING FEATHERS FROM GAME FOWL

Ralph H. Herolzer, 752 Chateau Ave., Cincinnati, Ohio 45204

Filed Dec. 11, 1979, Ser. No. 102,344
Int. Cl.³ A22C *21/02*
U.S. Cl. 17—11.1 R **9 Claims**



1. A device for removing feathers from game fowl and poultry comprising

a rotor including a hub disposed with its axis extending generally horizontally and a multiplicity of resilient feather removing fingers extending generally radially outwardly from said hub in annularly and axially spaced relation with respect to one another,

a feather catching housing including a front wall structure providing (1) exterior cover for an upper and rearward portion of the rotor, (2) exterior access to a lower and forward portion thereof, (3) a finger passage for the lower portion of the rotor, and (4) a feather receiving opening extending downwardly from said finger passage,

said housing having wall means extending rearwardly of said front wall structure providing (1) a feather enclosure for the upper and rearward portion of said rotor covered by said front wall structure which extends downwardly below said feather receiving opening and (2) a multiplicity of air openings of a size insufficient to pass feathers and of a number sufficient to allow for the low velocity flow of air outwardly of the feather enclosure,

means at the lower end of said feather enclosure for operatively connecting a feather catching bag therewith with an open end in operative relation rearwardly and below said feather receiving opening, and

means for rotating said rotor in a direction and at a speed such that the resilient fingers in the lower and forward portion thereof move arcuately downwardly and rearwardly so as to engage the upper and forward portion of a game fowl held in engagement therewith so that the feathers thereof engaged by the resilient fingers will be moved (1) by such engagement and (2) by the accompanying relatively high velocity flow of air established by the movement of the fingers through said finger passage through said feather receiving opening into said feather enclosure for deposit into the open end of a bag while the accompanying air flows at relatively low velocity outwardly of the enclosure through said multiplicity of air openings.

4,288,889

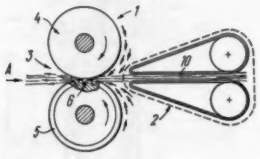
APPARATUS FOR DRAFTING FIBERS

Valentin N. Tikhonov, ulitsa Sh. Rustaveli, 55, kv. 28; Vitaly I. Zhestkov, Chilanzar, kvartal 19, dom 26, kv. 41; Gennady N. Shlykov, Chilanzar, kvartal 19, dom 31, kv. 3; Vasily M. Diachkov, Chilanzar, kvartal 7, dom 18"V", kv. 8; Viktor M. Mukhin, ulitsa B. Khmelnitskogo, 69, korpus 5, kv. 31, and Gennady V. Zhigalov, ulitsa Bogdana Khmelnitskogo 69, korpus 2, kv. 6, all of Tashkent, U.S.S.R.

Filed Sep. 5, 1979, Ser. No. 72,674

Int. Cl.³ D01H *5/74*

U.S. Cl. 19—236 **5 Claims**



1. An apparatus for isolating fibers of a fibrous material and for feeding isolated fibers to a subsequent operation comprising: a feeding pair of rolls; and an outlet pair of rolls, the outlet pair of rolls including a cylindrical roll with a profiled peripheral surface and a pressure roll in contact with said cylindrical roll along generatrix lines to define a zone of pinching of the fibrous material for isolating individual fibers, linear velocity of said outlet pair of rolls being many times greater than the linear velocity of said feeding pair of rolls, and said profiled peripheral surface being formed by alternating spaced projections arranged at points of intersection of helical lines, one group of said helical lines including a plurality of parallel righthand helical lines, and another group of said helical lines including a plurality of parallel lefthand helical lines, the ratio of angles of inclination of these lines to the generatrix of the roll being from 1.0 to 1.8, and the spacing of the projections along the righthand helical lines being different from the spacing of the projections along the lefthand helical lines when the ratio is 1.0.

4,288,890

HOOK FOR A HOOK-AND-EYE FASTENER

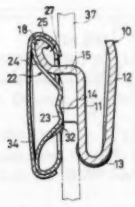
Yoshihiro Kanazaka, Nyuzen, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 12, 1980, Ser. No. 148,729

Claims priority, application Japan, Jun. 15, 1979, 54-81930[U]

Int. Cl.³ A44B *13/00, 1/42*

U.S. Cl. 24—227 **6 Claims**



1. A hook for a hook-and-eye fastener, comprising:

(a) a body including a base having a plurality of prongs projecting therefrom at spaced intervals; and

(b) a retainer including a central raised portion, an intermediate flaring portion extending outwardly from said central raised portion, and a peripheral bent lip portion extending from said intermediate flaring portion inwardly toward said central raised portion, said intermediate and bent lip portions jointly defining a retainer pocket surrounding said central raised portion, said central raised portion having a plurality of spaced ridges, each of said prongs being located between two of the adjacent ridges and having a bent end portion disposed in said retainer pocket, said base including a plurality of tongues each projecting radially outwardly between two of the adjacent prongs and lying in substantially the same plane as said base.

4,288,891

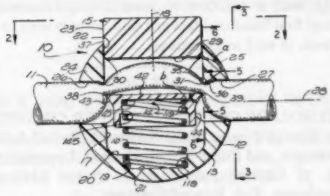
CORD LOCK HAVING DEPRESSABLE PLUNGER

Ogden W. Boden, 1580 Gaywood Dr., Altadena, Calif. 91101

Filed Mar. 7, 1977, Ser. No. 775,170

Int. Cl.³ F16G *11/00*

U.S. Cl. 24—115 G **13 Claims**



1. The combination comprising:

a body containing a passage;

a plunger mounted slidably in said passage for movement relative to said body along a predetermined axis, and having an end portion which is accessible from the outside of the body for manually pressing the plunger inwardly along said axis from a cord gripping position to a released position; and

a spring yieldingly resisting such inward axial sliding movement of the plunger;

said body and plunger having apertures through which a cord or cords can extend generally transversely of said axis and which in said released position of the plunger are essentially opposite one another to free the cord or cords for longitudinal movement, and which are defined in part by relatively movable edges of the body and plunger between which the cord or cords are clamped in said gripping position of the plunger to lock the cord or cords against longitudinal movement;

at least one of said edges, as viewed in planes containing said axis and extending through a corresponding one of said apertures in the vicinity of its center, being of sharpened sectional configuration defined by faces which converge toward one another at an acute angle substantially less than 90 degrees.

4,288,892

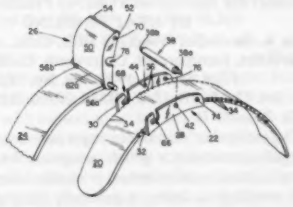
BUCKLE

John H. Mardirossian, Warwick, R.I., assignor to Paul Levinger, Providence, R.I.

Filed Dec. 18, 1978, Ser. No. 970,549

Int. Cl.² A44B *11/20, 11/25*

U.S. Cl. 24—206 B **12 Claims**



1. The combination of a first band end and a coupling mem-

ber of a buckle mountable in different positions longitudinally of said band end to receive a second band end therein for coupling said ends together,

said first band end having a plurality of indentations at each side edge arranged longitudinally thereof,

said member having a channel shape with a bottom wall and opposed sidewalls dimensioned to receive therebetween a portion of said first band end with one of its large surfaces engaging said bottom wall, said member having teeth located therein to lie opposite at least some of said indentations at each side of said first band end disposed therein at different relative longitudinal positions and dimensioned to penetrate at least some of said indentations when said first band end is pressed toward said bottom wall, and a pair of opposite presser members one fixed to each said sidewall in position to press the corresponding edge of said first band end toward said bottom wall to engage said teeth in said indentations.

4,288,893

METHOD OF COOLING STUFFER CRIMPED YARN

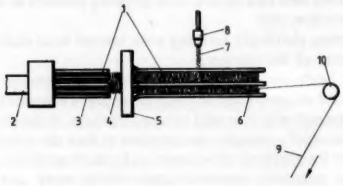
Heiko Herold, Neuss; Richard Herold; Rudolf J. Klee, both of Dormagen, and Edgar Muschelknautz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 13,895

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807490

Int. Cl.³ D02G *1/12*

U.S. Cl. 28—266 **2 Claims**



1. In process of texturizing yarn wherein yarn at an elevated temperature is formed into a wad in a stuffer section including an array of rod guide means and thereafter cooled, the improvement for cooling said yarn wad which comprises passing without guiding support said wad into a cooling section which cooling section is not directly connected to said stuffer section, pushing said wad through said cooling section equipped with an array of rod guide means, directing onto said wad a liquid jet which does not decompose to droplets while said wad is in said cooling section, thereafter removing yarn from said wad and deflecting the yarn as the same is removed from said wad to centrifuge liquid therefrom whereby a virtually dry yarn may be wound.

4,288,894

METHOD OF MANUFACTURING PRESSURE VESSELS BY HEAT FORMING

Alfonse A. Jacobellis, Woodland Hills, Calif., assignor to Greer Hydraulics, Incorporated, Chatsworth, Calif.

Filed Sep. 24, 1979, Ser. No. 78,013

Int. Cl.³ B21D *53/00*; B21K *29/00*; B23P *15/26*

U.S. Cl. 29—157 R **6 Claims**

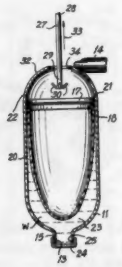
1. The method of manufacturing a pressure vessel for use as a hydraulic accumulator which comprises the steps of providing a cylindrical metal member, inwardly deforming a first end of said member to define a generally hemispherical portion having a central oil port,

providing a bladder assembly including a metallic retainer ring carrying a resilient, distensible elastomeric bladder member,

inserting said bladder assembly into the interior of said metal member through the other end of said member and advancing said retainer ring to an intemediate position within said member,

weldingly connecting said retainer ring to inner wall portions of said member about a circumferential weld line to divide said member into two chambers separated by said bladder assembly,

introducing a source of cooling fluid into said chamber



through said other end to induce an outward gaseous flow originating at a point adjacent said bladder and directed radially outwardly in directions conforming to the configuration of said bladder, while simultaneously heating and inwardly deforming the wall adjacent said other end of said cylindrical metal member at positions progressively nearer said other end while maintaining said cooling fluid flow, to cause said wall to assume a generally hemispherical configuration and reduce the diameter of said other end to define a central gas port,

and thereafter withdrawing said source of cooling fluid through said central port.

4,288,895

BEARINGS

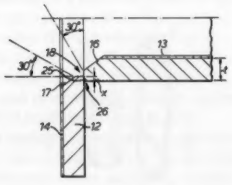
Brian D. Campbell, Harrow Weald, England, assignor to The Glacier Metal Company, Limited, Middlesex, England

Continuation of Ser. No. 849,465, Nov. 7, 1977, abandoned. This application Jun. 29, 1979, Ser. No. 53,518

Claims priority, application United Kingdom, Nov. 10, 1976, 46708/76

Int. Cl.³ B21D *53/10*

U.S. Cl. 29—149.5 C **15 Claims**



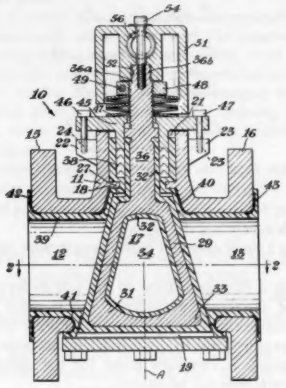
1. A method of making a flanged half-bearing in which a semi-cylindrical shell having an outer face and an inner face, and a semi-annular end flange having an outer face and an inner face, are held with the inner face of the flange in contact with one axial end of the shell over a partial thickness comprising less than the entire thickness of the shell, said partial thickness encompassing said inner face of said shell and a laser beam is applied around a semi-circular path where the inner face of the flange is in contact with the end of the shell adjacent said inner face of said shell to weld the flange and shell together.

4,288,896

METHOD FOR MANUFACTURING AN IMPROVED PLUG VALVE

Walter H. West, Bay City, and E. D. Prueter, Saginaw, both of Mich., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 925,082, Jul. 17, 1978, Pat. No. 4,219,046.
This application Dec. 17, 1979, Ser. No. 104,491
Int. Cl.[3] B23P *15/00;* B29D *3/02;* F16K *5/02*
U.S. Cl. 29—157.1 R 2 Claims



1. An improved method for the preparation of a plug valve, the steps of the method comprising providing plug valve body having a plug receiving cavity intermediate an entrance and exit port, the plug receiving cavity having a first region of lesser diameter and a second region of greater diameter, disposing within the body first and second rigid foraminous annular members, the members being disposed in the plug-receiving cavity, said first annular member being disposed in the region of lesser diameter and the second annular member being disposed in the region of greater diameter, embedding the annular members within a plastic lining thereby lining the plug receiving cavity and ports of the valve body, the plastic lining thereof having a service temperature, providing a plug suitable for use with the plug body, the plug being finished to a desired degree of taper, disposing the plug within the body, tensioning the plug into the plug-receiving cavity of the valve body, raising the temperature of the valve body and plug above the service temperature of the plastic lining of the valve body and forcing the plug into the cavity to thereby deform the liner of the valve body to conform to the valve plug and subsequently cooling body and plug below the service temperature of the valve body lining.

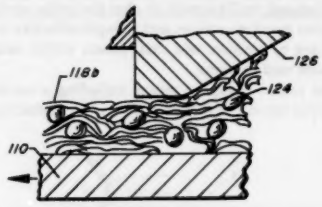
4,288,897

METHOD OF PRODUCING A NUCLEATE BOILING SURFACE ON A HEAT TRANSFER MEMBER

James G. Withers, Jr., Decatur, Ala., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 966,438, Dec. 4, 1978, Pat. No. 4,219,078.
This application Nov. 5, 1979, Ser. No. 91,327
Int. Cl.[3] B23P *15/26*
U.S. Cl. 29—157.4 4 Claims

1. A method of producing a nucleate boiling surface on a heat transfer member comprising the steps of: placing a layer of open cell reticulated organic foam into contact with the member; plating the foam layer and the underlying member with a metallic coating so as to surround the strands of the foam and integrally bond them to the member; heating the metallic coating to at least partially pyrolyze the strands of the foam so as to produce a reticulated array of connected, at least partially hollow metal strands which are periodically open to the atmosphere; engaging at least a substantial portion of the hollow metal strands with a plurality of solid particles with sufficient pressure to at least partially deform said hollow metal strands and reduce their internal diameter and their



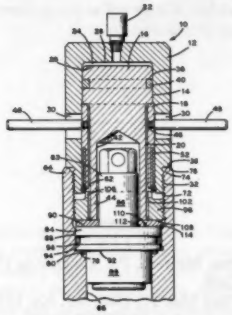
ability to transport liquid between spaced openings along their length.

4,288,898

CONTROL ROD DRIVE MECHANISM CLOSURE DEVICE

Marty E. Adcock, Logan, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 22, 1979, Ser. No. 86,986
Int. Cl.[3] B66F *3/24*
U.S. Cl. 29—240 10 Claims



1. A device for compressing a first member within a second member comprising a body portion having a bore therein and being attachable to said second member, piston means slidably receivable within said bore in said body portion and having a bore therein for the receipt of said first member, a sleeve member adjacent said piston means and axially movable therewith, and means for pressurizing said bore within said body portion causing axial movement of said piston means and said sleeve member resulting in the compression of said first member within said second member.

4,288,899

DISC BRAKE PISTON DEPRESSING TOOL

Edward A. McKee, 104 Rock Levee Rd., Scott City, Mo. 63780

Filed Sep. 24, 1979, Ser. No. 78,361
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—256 18 Claims

1. A tool for moving the piston into the cylinder bore of a disc brake caliper housing having a support bracket with two sections spaced with respect to each other to define an opening disposed opposite to said piston, said tool comprising:

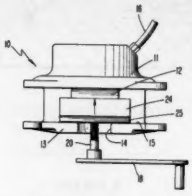
(a) a threaded shaft means having a piston engaging means rotatably connected at a fixed location at one end of the shaft means and a shaft rotating means rigidly secured to the other end thereof, and

(b) brace means threadingly engage said shaft means to be

movable with respect to the piston engaging means at a location intermediate the two ends of the shaft means,

(c) said brace means including a first bar of material having a structural configuration to abut the inside surface of the support bracket sections and a length effective to span the opening to position said shaft means within said opening beween said sections,

(d) said piston engaging means including a second bar of material having two ends and a piston contacting surface



means therebetween, said piston contacting surface means being effective to exert pressure against opposing edges of the piston when the shaft rotating means is rotated while the brace means abuts the inside surface of the support bracket,

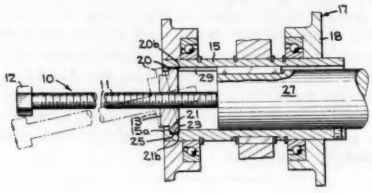
(e) said one end of the shaft means being rotatably located on the side opposite said piston contacting surface means of the second bar of material at the geometric center of said second bar of material.

4,288,900

PULLER TOOL

John S. Overton, Malvern, Pa., assignor to FMC Corporation, San Jose, Calif.

Filed May 27, 1980, Ser. No. 153,127
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—263 **3 Claims**



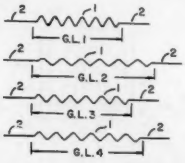
1. In a tool for removing from a shaft a sleeve that is supported thereon and has an annular internal groove spaced inwardly from an end of the sleeve and an internal slot leading from the end of the sleeve to the groove, a threaded rod adapted to be projected into the sleeve and positioned with an end in abutment with the end of the shaft, a puller plate threaded on said rod, said plate having a central body portion of generally rectangular configuration, and means defining a flange at each end of said body portion, the length of each flange measured longitudinally of said rod being less than the width of the internal groove in the sleeve, and the width of one flange being less than the width of the other and adapting said one flange to be moved through the slot to a position in alignment with the groove.

4,288,901

METHOD OF MANUFACTURING AND CALIBRATING A DISPLACEMENT MEASURING SENSOR

Clarence O. Babcock, 5 S. Flower, Lakewood, Colo. 80226

Division of Ser. No. 790,013, Apr. 22, 1977, Pat. No. 4,170,897.
This application Jun. 27, 1979, Ser. No. 52,471
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—407 **1 Claim**



1. A method for manufacturing and calibrating a helical wire sensor, which comprises the steps of:

(a) winding a small diameter high strength wire into a helical coil;

(b) applying a first elongation to the coil to form a helical sensor of a selected geometry, with a given flexibility, elastic displacement range, and sensitivity which is inversely proportional to the displacement range;

(c) determining a vibratory more for the elongated coil having such selected geometry;

(d) applying a second elongation to the coil which is less than the first, and obtaining a second vibratory mode determination; and

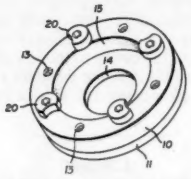
(e) comparing said first and second vibratory modes to corresponding displacements to calibrate the helical wire sensor prior to use.

4,288,902

METHOD OF FORMING A NOTCHED EDGE LOCK SCREW

Louis J. Franz, 313 Crane Ave., Royal Oak, Mich. 48067

Filed Oct. 5, 1979, Ser. No. 82,140
Int. Cl.³ F16B *19/02*
U.S. Cl. 29—407 **2 Claims**



1. A method of forming a notched edge lock screw having a threaded shank and a head provided with a notch, and being of the type used for locking a die part insert within a retainer which is provided with a socket for receiving a portion of the insert, and with the insert having a lock-screw head receiving groove aligned with a seating surface formed on the retainer and the seating surface surrounding a threaded lock screw shank receiving opening so that the base of the lock screw head tightly engages the seating surface when a portion of the screw head overlaps the retainer socket and is received within the insert groove for locking within the retainer socket, and the screw head base is spaced a short distance from the seating surface when the screw is loosened relative to the threaded opening for aligning the notch formed on the screw head with the adjacent socket edge portion and insert edge portion so that the insert is unlocked, comprising:

forming an un-notched master screw, which otherwise is a substantial duplicate of the lock screw, with a substantial number of segment markings equally spaced around the peripheral edge portions of its head, so that the head circumference is visually divided into a large number of segments;

applying said master screw into a pre-existing retainer threaded opening and observing the markings which delineate the portion of the socket which is overlapped by the head of the master screw when the master screw is tightly in place;

machining a notch in a lock screw corresponding to, but circumferentially offset relative to, the observed marked overlapping master screw head portions, so as to position the notch with one of its ends at the retainer socket defining wall, so that the notch extends roughly perpendicularly away from the retainer socket defining wall when the lock screw head is tightly in contact with the retainer seat surface;

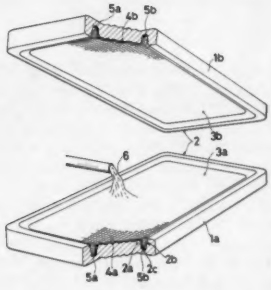
and thereafter, threadedly applying said lock screw to said preexisting retainer opening for use therein.

4,288,903

METHOD FOR PRODUCING STUFFING FOR A SPRING-TYPE MATTRESS

Tamio Matsuda, Nishio, and Sakuichi Tanikawa, Aichi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 22, 1979, Ser. No. 68,569
Claims priority, application Japan, Sep. 8, 1978, 53-110886
Int. Cl.³ B29D *27/04;* **B23P** *17/00*
U.S. Cl. 29—416 **4 Claims**



1. A method for producing stuffing to form a spring-type mattress assembly including at least one spring member utilizing upper and lower mold members, which comprises:

forming grooves along the entire circumferential edge portions of said upper and lower mold member;

fixing a dense seat member on a flat surface of said lower mold member and a relatively less dense seat member on a flat surface of said upper mold member;

bending edge portions of each of said seat members into said grooves of said upper and lower mold members;

inserting and fixing elastic plates within said grooves of said upper and lower mold members;

pouring a predetermined quantity of an undiluted solution of plastics to be foamed onto said flat surface of said lower mold;

tightly contacting said upper and lower mold members together for therein expanding and forming said undiluted solution of plastics into a resulting mass, thereby forming a stuffing member integrally composed of said resulting mass, each of said seat members and said plates;

horizontally and symmetrically cutting and dividing said stuffing member into a first part and a second comparatively hard part;

turning said first and second parts of said stuffing member over and assembling them so as to engage respective elastic plates of said first and second parts and cover said at least one spring; and

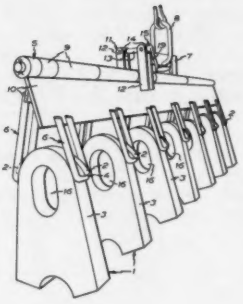
covering said two parts of said stuffing member by an outer decorative member to form said mattress assembly.

4,288,904

METHOD AND APPARATUS FOR THE REVERSAL OR REPLACEMENT OF HAMMERS IN HAMMER MILLS

Ernst R. Lindberg, Svedala, Sweden, assignor to Svedala-Arbra AB, Svedala, Sweden

Filed Mar. 2, 1979, Ser. No. 17,163
Claims priority, application Sweden, Mar. 3, 1978, 7802439
Int. Cl.³ B66C *1/30;* **B02C** *13/00;* **B23P** *19/04*
U.S. Cl. 29—426.3 **8 Claims**



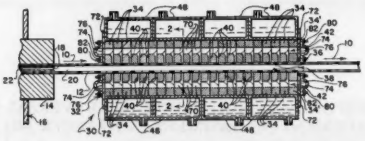
1. Method for replacement of hammers in a hammer mill in which at least one series of hammers, after mounting in the hammer mill, is pivotally suspended in a row on a bar which extends through holes in the hammers and is connected to the rotor of the hammer mill, which method comprises the steps for removal of said row of hammers, of manipulating a gripping device having a series of gripping members with spacing equal to the prescribed spacing between the hammers, and grasping the hammers in the row by means of these gripping members by engagement with the hammers at their upper end portions, such that the hammers are held, by means of the gripping members substantially in unchanged mutual positions; lifting said gripping device with the row of fixedly retained hammers a distance sufficient for relieving the bar of the weight of the hammers; releasing said bar from said row of hammers and lifting the hammer row out of the hammer mill; and that, for remounting the hammers, the method comprises the steps of placing the hammers in a row on a base outside the hammer mill such that the hammers in the row have the same mutual spacing as said prescribed spacing; bringing the gripping device with its gripping members into engagement with the hammers at their upper end portions, such that the holes in the hammers are positioned to allow the insertion of the bar, lifting the hammers and lowering them into the hammer mill to a position in which the bar can be inserted into the row of aligned holes in the row of hammers and can be connected to the rotor without the bar being loaded with the weight of the hammers; and lowering the gripping device such that the hammers are supported on the bar, and then releasing the gripping device from the hammers and lifting the gripping device out of the hammer mill.

4,288,905

METHOD OF FABRICATING VACUUM SIZING APPARATUS

Milton Kessler, 6690 Harrington Ave., Youngstown, Ohio 44512

Division of Ser. No. 863,886, Dec. 23, 1977, Pat. No. 4,181,487.
This application Sep. 10, 1979, Ser. No. 73,650
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—526 R **8 Claims**



1. A method of fabricating a vacuum sizing apparatus comprising the steps of:

(a) forming a plurality of structural segments which, when arranged side-by-side, have inner wall portions extending contiguously to define a sizing surface, with adjacent ones of the segments having side walls extending in mating engagement and intersecting the sizing surface;

(b) forming a plurality of vacuum channel grooves in the side walls of the segments, the grooves being configured and arranged such that when the segments are positioned in said side-by-side arrangement, each of the grooves will define at least a part of a vacuum channel opening through the sizing surface;

(c) clamping the segments together in said side-by-side arrangement; and,

(d) providing conduit means for communicating the grooves with a vacuum source.

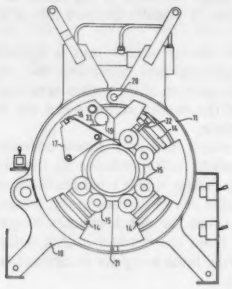
4,288,906

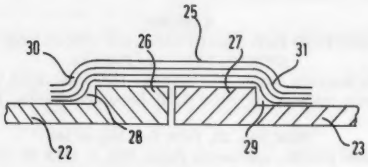
PIPE JOINTING

Philip J. Cocks, and Derek A. Newton, both of Warwickshire, England, assignors to Dunlop Limited, West Midlands, England

Filed Oct. 22, 1979, Ser. No. 87,036
Claims priority, application United Kingdom, Oct. 25, 1978, 41948/78
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—526 R **16 Claims**

1. A method of forming a joint between pipes having respective increased diameter end formations the method comprising winding a ductile metal strip wider than the two end formations over the end formations, bending the lateral portions of the strip downward toward the pipes behind the formations so that the formations are locked together by an enclosure formed





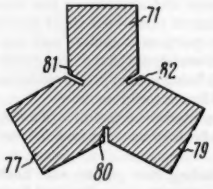
by the wound and deformed strip which has reduced diameter lateral portions on opposite sides of the formations.

4,288,907

METHOD OF MAKING BILLETS

Julian M. Chumanov, ulitsa Rozy Ljuxemburg, 65, kv. 33, Donetsk; Anatoly L. Liberman, Teply stan, 5 mikroraion, korpus 65, kv. 259, Moscow; Vladimir I. Listopad, Schelkovsky proezd, 7, korpus 1, kv. 51, Moscow; Vasily V. Polyakov, Kosinskaya ulitsa, 18, korpus 3, kv. 19, Moscow; Vyacheslav F. Gubaidulin, ulitsa Schorsa, 23, kv. 16; Grigory M. Shulgin, ulitsa Izjumovskaya, 5, kv. 232, both of Donetsk; Dmitry P. Evteev, ulitsa Chelyabinskaya, 10/2, kv. 137, Moscow; Sergei P. Efimenko, bulvar Pushkina, 29, kv. 18, Donetsk; Veniamin V. Fulmakht, ulitsa Novolesnaya, 6, kv. 16, Moscow; Vladimir P. Slednev, ulitsa Artema, 147 "V", kv. 16, Donetsk; Viktor I. Pogorzhelsky, ulitsa Mironovskaya, 26, kv. 57, Moscow; Valentin B. Shum, ulitsa Artema, 169, kv. 21, and Anatoly A. Tolpa, ulitsa Tkachenko, 85, both of Donetsk, all of U.S.S.R.

Filed Jun. 28, 1978, Ser. No. 919,785
Int. Cl.³ B22D *11/126*
U.S. Cl. 29—527.6 **10 Claims**



1. A method of making billets, comprising the steps of forming a composite billet having a central portion and at least three ray members disposed symmetrically relative to the central longitudinal axis of said composite billet; each ray member being partially defined by a pair of opposed bases, a first one of which is situated at the juncture of the ray member

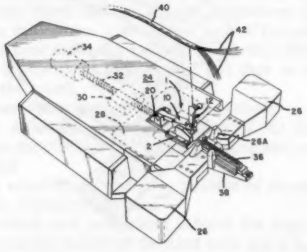
with the central portion of said composite billet and a second one of which is situated at the side of the ray member opposite to the first base; providing that the ray members of said composite billet are free of any zone in which chemical constituents are segregated by forming each ray member with the first base of each ray member at the place of its juncture with the central portion of said composite billet being 0.72 to 2.3 times the height of said ray member, the second base being 0.5 to 1.0 times the height of said ray member so that any such segregation zone is localized in the central portion of said composite billet; forming stress raisers in the form of indentations at the region of the juncture of respective pairs of adjacent ray members, said indentations having a depth of about 0.07 to 0.2 times the height of the ray member and having a width of about 0.02 to 0.1 times the height of the ray member; and concurrently severing said ray members of the composite billet from said central portion.

4,288,908

CABLE CLAMPING AND ORIENTING APPARATUS

John G. Hatfield, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1979, Ser. No. 88,691
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—564.1 **7 Claims**



1. Apparatus comprising a frame mounting a holder for an electrical connector, indexing means, a wire connecting mechanism linked to said indexing means for indexed traverse in respect to said connector and successive indexed alignment with terminals of said connector, said wire connecting mechanism being operative for connecting individual wires with respective said terminals, and a cable clamp movable with said wire connecting mechanism for holding a multiple wire cable during connection of the individual wires thereof with said terminals, characterized in that said clamp and said frame are linked by cam means for moving said clamp and said cable held thereby relative longitudinally and transversely of said connector during said traverse of said wire connecting mechanism.

4,288,909

AUTOMATIC TOOL CHANGER FOR MACHINE TOOL

Ervin J. Kielma, West Allis; Albin J. Schabowski, Milwaukee, and John T. Currer, Wauwatosa, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Oct. 25, 1978, Ser. No. 954,438
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **3 Claims**

1. In a machine tool having an automatic tool changer for changing the tools used to operate on a workpiece;

a bed;

a column slidably supported by said bed for movement in a rectilinear path of travel;

a spindlehead carried by said column for movement therewith along said rectilinear path of travel;

a spindle rotatably supported by said head and adapted to receive a rotary cutting tool for operating on a workpiece, the improvement comprising:

a frame slidably supported by said bed and being attached to said column for movement with said column in said rectilinear path of travel;

a tool storage magazine mounted on said frame and adapted to carry a plurality of vertically positioned cutting tools for use in said spindle;

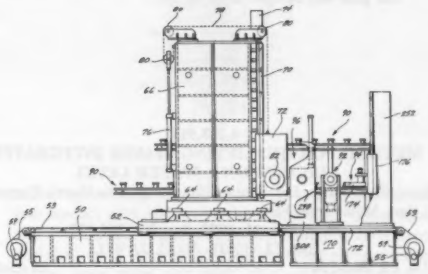
means associated with said magazine for selecting the next tool to be used in said spindle; and

tool transfer means mounted on said frame in position to transfer tools between said tool storage magazine and said spindle, whereby said magazine and said tool transfer means are carried by said bed but move with said column by reason of their mounting on said frame so that they always remain in proper position relative to said spindle along said rectilinear path of travel for completing a tool interchange operation

a tilt adapted to receive a tool;

a tool gripper arm movably supported by said frame for transferring a tool from said magazine to said tilt unit in a vertical position and to return the tools from said tilt unit to said magazine; and

means connected to pivot said tilt unit between a vertical position for receiving tools from said tool gripper arm and a horizontal position for locating a tool in position to be engaged by said tool transfer means for transfer to said spindle and to receive a previously used tool from said transfer means for return to said magazine.

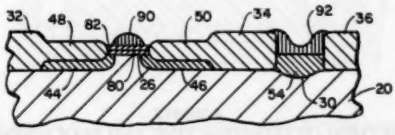


4,288,910

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Richard H. Heeren, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 16, 1979, Ser. No. 30,255
Int. Cl.³ H01L *21/22*
U.S. Cl. 29—571 **9 Claims**



1. A method of manufacturing devices on a semiconductor wafer **23** of a first conductivity type having formed on the body **20** of the wafer **23** a masking medium **22**, removing selected portions of the masking medium **22** to expose the surface of the body **20** thereby defining field regions **31** on the surface of the wafer and forming a field insulator **32**, **34**, **36**, at the exposed locations on the surface of the body **20**, wherein the improvement comprises the steps of:

A. Removing selected portions of the remaining masking

medium **22** so as to define source/drain regions **29** and interconnect runs **28** on the surface of the wafer **23**,

B. Doping the source/drain regions **29** and interconnect runs **28** to a second conductivity type **44**, **46**,

C. Forming an insulator **48**, **50** over the doped source/drain regions **29** and interconnect runs **28**,

D. Removing the masking medium **22** covering an electrical contact area **30**,

E. Doping the electrical contact area **30** to a second conductivity type **54**,

F. Preparing the gate and contact area **26**, **30** for reception of electrical conductors **60**, **61**, and

G. Placing electrical conductors **60**, **61** at selected locations on the wafer **23** surface to provide electrical contact with the gate and contact area **26**, **30**.

4,288,911

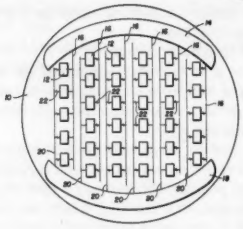
METHOD FOR QUALIFYING BIASED INTEGRATED CIRCUITS ON A WAFER LEVEL

Kenneth A. Ports, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 21, 1979, Ser. No. 106,127

Int. Cl.[3] **H01L** *21/66, 21/423*

U.S. Cl. 29—574 **23 Claims**



1. A method for qualifying radiation hard integrated circuits at the wafer level comprising:

electrically interconnecting the dice containing said integrated circuits on the wafer electrically;

electrically biasing the dice on said wafer;

irradiating the wafer with gamma ray radiation while said dice are electrically biased;

annealing said dice sufficiently to remove radiation damage; and

testing the circuitry on said dice.

4,288,912

METHOD OF CONSTRUCTING AND PROCESSING A DIODE CAPACITOR ASSEMBLY

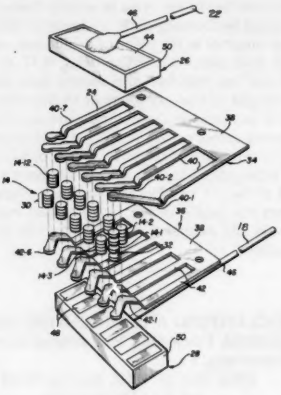
Walter L. Wills, Mesquite, Tex.; Herchel A. Vaughn, Winter Park, Fla., and Larry L. Miller, Garland, Tex., assignors to Varo Semiconductor, Inc., Garland, Tex.

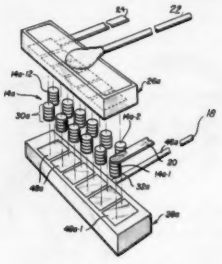
Filed Sep. 11, 1978, Ser. No. 941,005

Int. Cl.[3] **H01L** *21/603, 25/16*

U.S. Cl. 29—577 C **8 Claims**

1. A process for making a diode/capacitor assembly comprising the steps of: providing a plurality of semiconductor diodes each having an anode end and a cathode end, electrically and mechanically joining selected anode ends and cathode ends of said plurality of diodes to multiple-plate capacitor means to define an electrical circuit configuration of diodes





and capacitors, and thereafter etching and passivating the assembled diodes and capacitors as a group.

4,288,913

METHOD OF FORMING IN SITU GELLED ANODE

Frank E. Parsen, Irvington, and Teresita O. Graham, Dobbs Ferry, both of N.Y., assignors to Duracell International Inc., Bethel, Conn.

Filed Dec. 26, 1979, Ser. No. 106,995

Int. Cl.[3] **H01M** *6/04*

U.S. Cl. 29—623.5 **11 Claims**

1. A method for forming a cell having a substantially homogeneously gelled anode comprising the steps of mixing a powdered anode metal with a gelling agent, and with liquid means other than the gelling agent for maintaining, during subsequent gelling, a homogeneous mixture of the powdered metal, said gelling agent and a liquid, said gelling agent being capable of gelling the powdered anode metal when in the presence of an aqueous electrolyte solution; and then dispensing the resulting ungelled mixture into an electrolyte solution in an electrochemical cell, whereby the substantially homogeneously gelled anode is formed in situ.

4,288,914

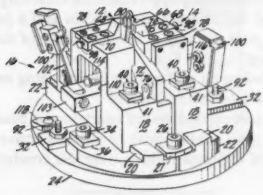
ADJUSTABLE MECHANISM FOR CUTTING AND CLINCHING ELECTRICAL COMPONENT LEADS

Stanley R. Vancelette, Manchester, N.H., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 942,286, Sep. 14, 1978, abandoned. This application Oct. 30, 1980, Ser. No. 202,245

Int. Cl.[3] B23P *19/00*; B21F *1/00*

U.S. Cl. 29—741 1 Claim



1. A cut-clinch assembly for acting on component leads inserted through spaced receiving holes of a circuit board, comprising:

a pair of cut-clinch units arranged in side-by-side relation;

means mounting the units for movement toward and from the circuit board and for angular adjustment about an inserting axis normal to the board, each of the units comprising a fixed knife and a relatively movable knife cooperative therewith to shear a lead and then to clinch it against the board;

a mechanism for actuating the movable knives;

means for adjusting operating positions of the units in a direction parallel to a line interconnecting said receiving holes, and

means for adjusting an operating position of the units in a direction normal to said line;

each cut-clinch unit comprising a block for supporting a non-conductive holder of the fixed knife and a lead guide block having at least a portion extending above said knife and engageable with the board at opposite sides of a lead-receiving hole, and a pair of shims of selected thickness insertable one between the block and an underside of said holder and the other between the block and an underside of said lead guide block to adjust the distance between an upper surface of said movable knife and an under surface of said circuit board to permit adjustment of the lead length and angle the lead makes with the board after cutting, and to adjust the distance between the knives to establish a proper clearance therebetween, respectively.

4,288,915

COMMUTATOR PULLER

Printes G. Bell, Bellwood, Ill., assignor to Bell-Terry Automotive Electric, Inc., Chicago, Ill.

Filed Sep. 28, 1979, Ser. No. 80,011

Int. Cl.[3] H02K *15/00*

U.S. Cl. 29—762 5 Claims

1. A commutator puller for extracting a commutator from an armature having a shaft, windings and commutator comprising:

a frame;

plunger means movably mounted for axial movement with respect to said frame;

power means operatively connected to said plunger means, said power means being selectively operable to move said plunger means axially toward said armature to disconnect said commutator from said armature;

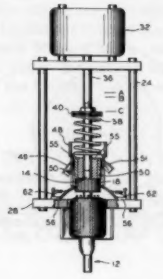
gripping means operatively connected to said plunger means to hold said commutator against axial movement relative to said plunger means; and

means to release said commutator from said gripping means;

said gripping means comprising teeth means pivotally mounted to said frame adjacent said plunger means;

actuator means adapted to contact said teeth means and force said teeth means against said commutator; and

first spring means operatively connected to said plunger means and said actuator means, whereby movement of said plunger means towards said shaft forces said actuator



means against said teeth means to pivot said teeth means into contact with said commutator, said teeth means holds said commutator in place while said plunger means forces said shaft away from said commutator, said plunger means moves away from said shaft after said commutator is extracted from said armature, and said teeth means then releases said commutator.

4,288,916

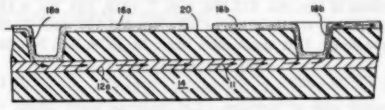
METHOD OF MAKING MASS TERMINABLE SHIELDED FLAT FLEXIBLE CABLE

Surendra Verma, Irvine, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 963,599, Nov. 24, 1978, Pat. No. 4,209,215. This application Dec. 26, 1979, Ser. No. 106,988

Int. Cl.[3] H01B *13/20*; H05K *3/00*; H01R *43/04*

U.S. Cl. 29—828 12 Claims



1. A process of producing a mass terminable shielded electrical cable having a plurality of side by side spaced-apart conductors enclosed in insulation comprising the steps of:

establishing repeated electrical contacts between electrically conductive shield material on the insulation and at least one of the conductors; and

creating a gap in said electrically conductive material for enabling terminations to be made respectively to the conductors and to the electrically conductive material, the repeated electrical contacts maintaining electrical continuity of the electrically conductive material across the gap.

4,288,917

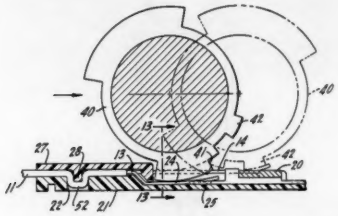
METHOD OF FORMING CONNECTOR-CABLE WITH CRIMPED ELECTRICAL TERMINATIONS

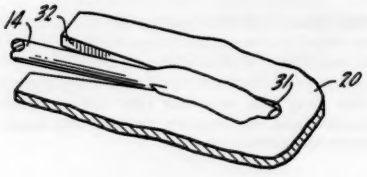
Edward P. Brandeau, Willimantic, Conn., assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 918,813, Jun. 26, 1978, Pat. No. 4,173,388, which is a continuation of Ser. No. 771,109, Feb. 23, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,368

Int. Cl.³ H01R *43/02*

U.S. Cl. 29—860 **5 Claims**





1. In the method of making a cable termination assembly, the steps comprising, bending a flat, insulated multiple wire cable near one end into a sharply angled rib, using said rib as an anchor when cutting the cable insulation and pulling the cut insulation toward but not completely free of the ends of said cable wires so that the cable can be handled without disarranging the stripped wires by manipulating the partially stripped insulation, fitting said cable end in a connector body using said rib and a locking groove in the body as indexing members, and simultaneously laying said wires in proper position for termination within said body.

4,288,918

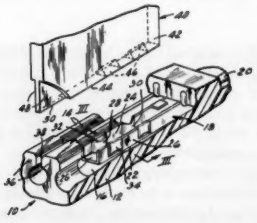
METHOD AND APPARATUS FOR MAKING A CRIMPED, INSULATION-PIERCE ELECTRICAL CONNECTION

John P. Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 875,856, Feb. 7, 1978, Pat. No. 4,159,156, which is a continuation of Ser. No. 703,637, Oct. 7, 1976, abandoned. This application Mar. 26, 1979, Ser. No. 24,114

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—868 **21 Claims**



1. In a method of terminating an insulated conductor in an insulation-piercing contact portion in which a conductor is engaged by an insertion blade and pressed into an insulation-piercing notch formed by at least one insulation-piercing contact jaw which extends at an angle to a supporting member, the improvement therein comprising the steps of:

cutting a section of the contact jaw; and

simultaneously with the step of cutting, folding the cut section over the conductor.

6. A tool for inserting and securing an insulated conductor in an insulation-piercing portion of an electrical contact, which portion has an outwardly open notch for receiving a conductor transversely of the axis of the conductor and a pair of spaced apart contact jaws defining at least a portion of the notch, said tool comprising:

a blade including an end surface for engaging and pressing a conductor into the notch; and

a pair of cutters carried spaced apart on said blade for engaging respective contact jaws to cut and convergently peel portions of the contact jaws over the conductor.

4,288,919

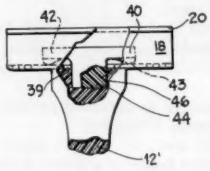
SAFETY RAZOR WITH MEANS TO SLIDABLY MOUNT CARTRIDGE

Joseph M. Rait, 1100 Amherst St., Buffalo, N.Y. 14216

Filed Apr. 19, 1979, Ser. No. 31,470

Int. Cl.³ B26B *21/06, 21/52*

U.S. Cl. 30—47 **3 Claims**



2. A safety razor assembly comprising a receptor, a handle extending generally perpendicularly from said receptor and means for retaining a blade cartridge on said receptor, said receptor and said handle including interengaging slot and neck means for providing sliding engagement between said handle and said receptor in a line parallel to the longitudinal axis of said receptor and cooperating abutment means on said slot and neck means to limit the extent of the sliding movement.

4,288,920

SHAVING SYSTEM WITH PIVOTALLY MOUNTED RAZOR CARTRIDGE

Paul W. Douglass, Winchester, and Robert A. Trotta, Winthrop, both of Mass., assignors to The Gillette Company, Boston, Mass.

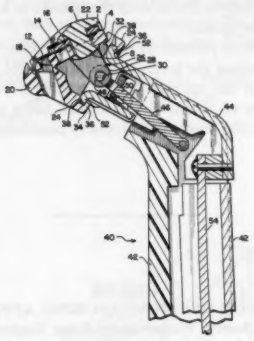
Filed Nov. 13, 1979, Ser. No. 93,692

Int. Cl.³ B26B *21/14*

U.S. Cl. 30—47 **9 Claims**

1. A shaving system comprising a handle and a blade assembly, the handle comprising first and second connecting means extending from an end thereof, said first handle connecting means being disposed within said second handle connecting means, the blade assembly comprising a first body portion having thereon a first blade assembly connecting means and a second body portion having thereon a second blade assembly connecting means, the first blade assembly connecting means being pivotally connected to the first handle connecting means, and the second blade assembly connecting means being fixedly connected to the second handle connecting means, said

blade assembly first body portion being pivotally joined to said blade assembly second body portion, said second handle con-



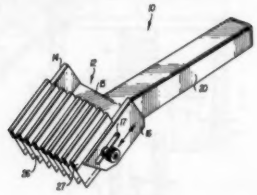
necting means being movable in directions transverse to the axis of a grip portion of said handle.

4,288,921

ADJUSTABLE FISH SCORER

Oden H. Rhynes, 311 S. West Ave., Republic, Mo. 65738

Filed May 2, 1979, Ser. No. 35,339
Int. Cl.³ B26B *3/00*
U.S. Cl. 30—304 **8 Claims**



1. A razor blade holding device adapted for holding a plurality of parallel spaced, replaceable single edge razor blades, said device being adjustable for positioning and locking the cutting edges of the blades at various cutting depths when used for scoring fish and for safely retracting the blades to a position where no blade cutting edges are exposed when not in use comprising:

a blade holding body having a planar, flat bottom surface and two upwardly extending spaced parallel side walls defining a front and back opening;

a handle attached to said blade holding body;

an elongated slot in each of said side walls having a longitudinal axis in a direction parallel to the plane of the planar, flat bottom;

a plurality of single edge razor blades each having a bottom blade cutting edge and a U-shaped safety backing plate providing an edge on each side of the blade adjacent the blade edge opposite the cutting edge;

blade securing means to secure (a) said plurality of single edge razor blades in a parallel, spaced apart relation between the two parallel side walls of the body and to maintain the blade cutting edges in approximately the same plane from the planar, flat bottom surface, said blade securing means comprising a blade support member extending between the elongated slots in both side walls with a slot extending element extending out through the slot in each side wall and a plurality of spacer elements slidably mounted on said support member between said side walls, said spacer elements being positioned between the razor blades and under the edge of the U-shaped safety backing plate of each blade with said spacer elements extending further down from the shaft toward the bottom surface than the blades and with said spacer elements abutting the flat bottom surface so as to prevent rotation of the blades about the shaft; and

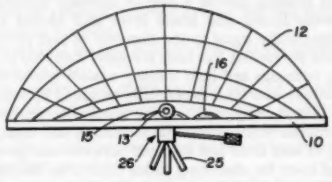
blade position locking means adjustably locking and unlocking the extending elements against the outer sides of the side walls whereby the blade support member can be positioned toward the front opening and locked in position so the razor blades will extend out past the planar, flat bottom surface for cutting and whereby the blade support member can be positioned toward the back opening and locked in this back position so the razor blades will be maintained back within the parallel side walls where the cutting edges of the blades are not available for cutting.

4,288,922

DEVICE TO INDICATE SOLAR EXPOSURE

Donald F. Lewis, deceased, late of 105 Rockwood St., Grass Valley, Calif. 95945 (by Sheri Lewis, administrator)

Filed Apr. 25, 1979, Ser. No. 33,110
Int. Cl.³ G01C *1/00*
U.S. Cl. 33—1 DD **3 Claims**



1. A device useful for investigating annual solar exposure of a specific site comprising:

a flat table having arcurate means adapted to receive a stiff, flexible material;

a transparent screen made of stiff, flexible material fixed to said arcurate means with said transparent screen having markings indicating the line of travel of the sun at a given latitude for selected dates of the year, and having markings indicating the position of the sun at selected times of the day with respect to the north-south orientation of said table;

a wide angle viewer fixed to said table in a position to view said screen, with the axis of the wide angle viewer perpendicular to the tangent of said screen at the solar noon position;

a compass fixed to said table with its north-south axis aligned parallel to the axis of said wide angle viewer; and

a level positioned to indicate the horizontal orientation of the upper surface of said table.

4,288,923

TAPE MEASURE

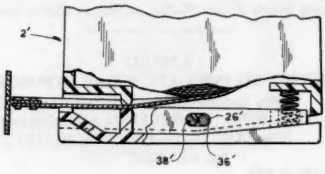
Werner Duda, West Sayville, N.Y., assignor to Roe International, Inc., Patchogue, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,296
Int. Cl.³ G01B *3/08*
U.S. Cl. 33—138 **9 Claims**

1. A tape measure comprising:

a housing having an opening defined therein; an extensible measuring tape coiled within said housing including a free end extending through said opening and adapted to move between retracted and extended positions; a hook member mounted on said free end of the tape; a braking lever pivotally mounted on said housing and having a first end portion including a free end positioned to engage said hook member when said measuring tape is in its retracted position; spring means extending perpendicularly to said lever

for normally biasing said first end portion of said lever into engagement with said tape to prevent movement thereof; and separate means for absorbing the shock of impact when said hook member engages the free end of said lever during the return of said tape to said retracted position, including a pivot pin mounted in said lever for pivotally mounting said lever on said housing and permitting longitudinal movement of the lever in the direction of tape retraction perpendicularly to said spring means and relative to the pivot pin, said lever having enlarged openings formed therein of substantially larger dimension in the direction of tape retraction than the diameter of said



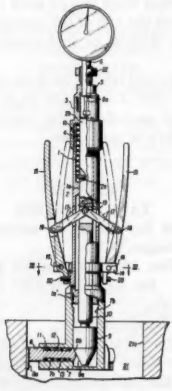
pivot pin on which said lever is pivotally mounted, and said housing having a pair of opposed openings formed therein facing said brake lever and having a diameter substantially equal to the diameter of said pivot pin; said pivot pin having free ends pivotally mounted in said housing openings and held thereby against lateral movement, whereby said lever is pivotally mounted by said pivot pin on said housing, and a shock absorbing member of a deformable, resilient material located in said enlarged opening of said lever and engaged between said pivot pin and said lever for absorbing shock caused by the longitudinal movement of the lever relative to the fixed pivot pin upon said impact.

4,288,924

INSIDE DIMENSION MEASURING GAUGE

Ichiro Mizuno, and Masao Nakahara, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,709
Claims priority, application Japan, Jan. 25, 1979, 54-8482[U]
Int. Cl.³ G01B 5/12
U.S. Cl. 33—147 F **17 Claims**



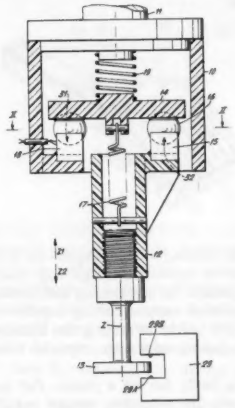
1. An inside dimension measuring gauge comprising:
a tubular body;
a spindle within said tubular body slidably movable in the axial direction of the tubular body;
an indicating means fixed to the first end of the tubular body, the indicating means including a contact plunger touching an end of the spindle;
a plurality of measuring contacts situated with respect to the tubular body to move with the spindle in a direction normal to the spindle;
a pair of levers pivoted to said tubular body; and
links connecting the levers to said spindle for inducing axial motion of the spindle in response to a compression or expansion of the levers, the links being pivotally connected to the levers and pivotally connected to said spindle.

4,288,925

PROBE FOR USE IN MEASURING APPARATUS

David R. McMurtry, Wotton-under-Edge, England, assignor to Rolls-Royce Limited and Renishaw Electrical Limited, both of London, England

Continuation of Ser. No. 864,151, Dec. 23, 1977, abandoned, which is a continuation of Ser. No. 858,024, Dec. 6, 1977, abandoned. This application May 17, 1979, Ser. No. 39,786
Claims priority, application United Kingdom, Dec. 24, 1976, 54032/76; May 28, 1977, 22656/77
Int. Cl.³ G01B 7/28
U.S. Cl. 33—174 L **18 Claims**



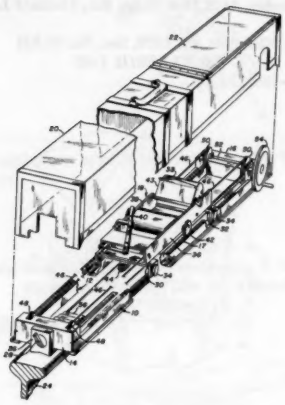
1. A probe for use in measuring apparatus, comprising a housing having a first two-dimensional seat therein, an intermediate member in said housing, bias means connected between the housing and the intermediate member to urge the intermediate member into engagement with the first seat thereby to support the intermediate member on the first seat, in a rest position, the intermediate member being tiltable on, and being linearly separable from, the first seat when displaced from said rest position in opposition to the bias means, a second two-dimensional seat provided on the intermediate member and facing in a direction opposite to that in which the first seat faces, a stylus holder, a further bias means connected between the stylus holder and the intermediate member to urge the stylus holder into engagement with the second seat thereby to support the stylus holder on the second seat in a rest position, the stylus holder being tiltable on, and being linearly separable from, the second seat when displaced from said rest position in opposition to the further bias means, and means responsive to the separation of the intermediate member and stylus holder from said first and second seats, respectively.

4,288,926

LONGITUDINAL RAIL PROFILOMETER

Lennart E. Long, Waltham, Mass.; Roger K. Steele, Pueblo, Colo.; David F. Coleman, West Medford, and Ralph A. Gustafson, Norton, both of Mass., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Filed Nov. 2, 1979, Ser. No. 90,744
Int. Cl.[3] G01B 5/20, 5/28
U.S. Cl. 33—174 P 7 Claims



1. Apparatus for measuring wear related undulations in a rail comprising:

means defining a reference plane comprising a pair of parallel beams, and a pair of transverse end members inter-connecting said beams adjacent the ends thereof;

sensor-recorder means mounted for movement on said beams comprising:

a movable rail contacting sensor, said sensor following undulations of a rail during movement of said sensor-recorder means along said beams, the movements of said sensor being relative to the plane defined by said reference plane defining means;

recorder means;

means coupled to said sensor for producing signals commensurate with vertical movements of said sensor and delivering said signals to said recorder means;

carriage means supported on said beams by roller means, said carriage means in turn supporting said sensor means, said recorder means and said signal producing means; and means for imparting motion to said sensor-recorder means comprising:

at least a first pair of pulleys, said pulleys of said pair mounted at spacially displaced points on said reference plane defining means;

elongated drive means passing around said pulleys, said drive means being flexible and being secured at opposite ends to said sensor-recorder means; and

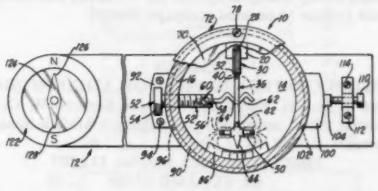
means for manually rotating one of said pulleys to cause said sensor-recorder means to move along said beams between said displaced points.

4,288,927

TERRESTRIAL MAGNETISM RESPONSIVE METHOD AND DEVICE INCLUDING A SOFT IRON BAR ON A FREE END OF A MAGNET

Raymond F. Stockton, 1780 Foothill Dr., Vista, Calif. 92083

Continuation-in-part of Ser. No. 829,265, Aug. 31, 1977, Pat. No. 4,217,699. This application Aug. 20, 1979, Ser. No. 68,119
Int. Cl.[3] G01C 17/08; G01V 3/08
U.S. Cl. 33—355 R 12 Claims



1. In a terrestrial magnetism responsive device adapted for working a northwardly or southwardly seeking magnet in any heading, comprising:

(a) a support member,

(b) a sensitive resilient member having one end secured to said support member,

(c) a pole seeking magnet having a free end for working in a selected heading,

(d) a non-seeking pole of the magnet secured adjacent the last pole to said resilient member adjacent its other end,

(e) said magnet extending substantially horizontally from said resilient member and being movable horizontally on said resilient member, and

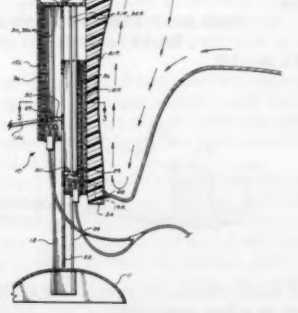
(f) a soft iron member attached adjacent the free end of the magnet and being balanced thereon to allow the magnet to be moved substantially horizontally.

4,288,928

METHOD FOR HEATING SKI BOOTS

Donald J. Stern, Bellingham, Wash., assignor to Allsop Automatic, Inc., Bellingham, Wash.

Division of Ser. No. 94,824, Nov. 16, 1979, Pat. No. 4,263,502. This application Jul. 22, 1980, Ser. No. 171,197
Int. Cl.[3] A43B 7/02; H05B 3/06
U.S. Cl. 36—2.6 9 Claims



1. The method of heating a ski boot of the type havng a flat planar sole portion comprising the steps of:

(a) removably clamping the ski boot to a vertically extending planar surface with the flat planar sole portion of the ski

boot in flat surface-to-contact with the vertically extending planar surface and extending vertically from toe to heel; and,

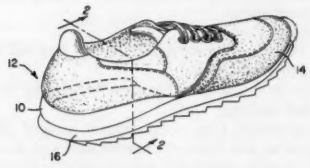
(b) heating at least the lower portion of the vertically extending planar surface so as to conductively heat that portion of the flat planar sole of the ski boot in surface-to-surface contact therewith and so as to generate convective air currents within the interior of the ski boot and thereby convectively heat the entire inner surface of the ski boot while maintaining the flat planar sole portion of the ski boot firmly clamped against the vertically extending planar surface to prevent warpage thereof.

4,288,929

MOTION CONTROL DEVICE FOR ATHLETIC SHOE

Edward J. Norton, Kingston, N.H., and Kenneth W. Graham, Melrose, Mass., assignors to New Balance Athletic Shoe, Inc., Lawrence, Mass.

Filed Jan. 15, 1980, Ser. No. 112,207
Int. Cl.³ A43B *23/08*
U.S. Cl. 36—69 **16 Claims**



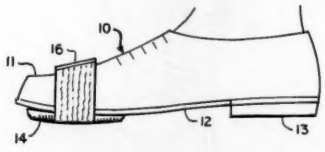
1. For use in footwear, a control device adapted to reside in a disposition above the sole of the footwear at least in the region of the heel and provide support for the lasted upper of the footwear, said control device including a body having a base with relatively flat upper and lower surfaces, and a wall extending upwardly from the upper surface around the heel and along both a medial and lateral side of the body, said wall throughout its length being of a height to confine the heel and along the medial side and around the heel the wall extends substantially vertically from the upper surface, and said lateral side has greater slope, said body being formed of a yieldable, but relatively sturdy material for support of the foot in a neutral plane, and said medial wall introducing a degree of rigidity in the maintenance of a normal range of motion of the foot during a running cycle.

4,288,930

REMOVEABLE TAPS

Donald G. Bornell, 860 Riven Rock Rd., Santa Barbara, Calif. 93108

Filed Jan. 7, 1980, Ser. No. 109,971
Int. Cl.³ A43B *5/12*
U.S. Cl. 36—132 **2 Claims**



1. A removeable tap for shoes having a sole and toe for tap dancing on a floor comprising:

(a) a tap body having an inner side and an outer side and having an outline generally in the shape of a shoe toe with a solid web inside the outline and having a pair of slots on opposite sides of the body, the inner side of the tap body being thinned between the slots and the outer side being thinned outboard of the slots to accommodate the thickness of the strap as it is passed through one slot across the inside of the tap body to the other slot so that the hard tap body will be in contact with the floor and sole of the shoe;

(b) a strap having a thickness passing through the slots and having ends that overlap over the top of the shoes;

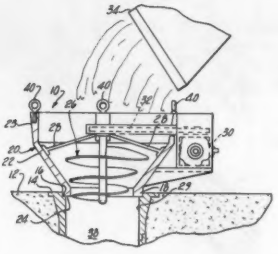
(c) and press-together pull-apart fastener patches on adjacent surfaces of the strap ends to achieve adjustment as well as fastening of the strap over the toe of the shoe.

4,288,931

METHOD AND CONVEYOR FOR SNOW REMOVAL

Glenn D. Rhodes, 4475 Dow Ridge Rd., Orchard Lake, Mich. 48033

Filed Nov. 19, 1979, Ser. No. 95,824
Int. Cl.³ E01H *5/00*
U.S. Cl. 37—10 **2 Claims**



1. Apparatus for removing snow comprising means for moving snow into a sewer manhole opening, said means including:

(a) an open ended hopper for receiving snow deposited therein, said hopper having an outlet adapted to be fit within said sewer manhole opening;

(b) an auger conveyor means within the hopper extending at least to the proximity of the outlet adapted to move snow in substantially its deposited form through the hopper and into said sewer manhole opening; and

(c) a motive power means for operating said auger conveyor means whereby snow is rapidly transferred to the sewer manhole opening without requiring a change of state of the snow.

4,288,932

SNOW REMOVAL BAR FOR THE SNOW REMOVAL PLATE OF A SNOW PLOW

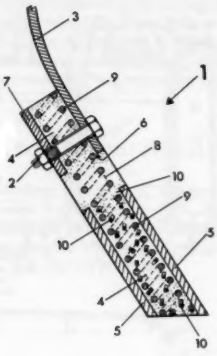
Walter Küper, Am Varenholt 56,, 4630 Bochum-Stiepel, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 115,832
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2904251
Int. Cl.³ E01H *5/06*
U.S. Cl. 37—42 VL **6 Claims**

1. A snow removal bar for the snow removal plate of a snow removal plow of the type including a rubber or plastic element which is reinforced with steel plates disposed on both sides thereof and which has an upper edge which is mounted on the lower edge of the snow removal plate with bolts, the improvement comprising:

said element being reinforced by steel plates disposed on both sides thereof only in the lower portion of said element which comes into contact with the road, said element also having a central portion disposed above said

lower portion which is reinforced by elastic reinforcements which are embedded in said element and extend



from said upper edge of said element to the lower portion thereof.

4,288,933

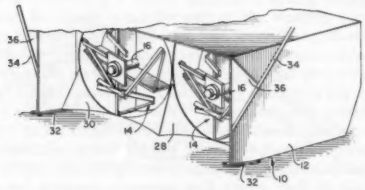
SNOWBLOWER

Walter Fair, Box 306, 150 W. Main, Menno, S. Dak. 57045

Filed Jan. 29, 1980, Ser. No. 116,405

Int. Cl.³ E01H *5/09*

U.S. Cl. 37—43 B **13 Claims**



1. A snowblower comprising a blower housing means having a forward end, snowblower fan means rotatably mounted within said housing means to engage snow passing into the forward end of said housing means, and snow discharge means mounted upon said housing means and adapted to receive snow from said snowblower fan means, said snow blower fan means including a fan body having a flat, circular surface extending in a first plane, a plurality of fan blades on said fan body extending outwardly from adjacent the center of said fan body, each said fan blade projecting from said flat circular surface and having a forward portion positioned outwardly from said first plane, and elongated ice chopper bars mounted upon said fan body and extending transversely across said fan blades, each said chopper bar being in contact with the forward portion of a fan blade at a point intermediate the ends of said chopper bar, the chopper bars being positioned to extend at an acute angle to said first plane.

4,288,934

IRONING MANGLE

Rene Gasser, Wolfhausen, Switzerland, assignor to Maschinenfabrik Ad. Schulthess & Co. Aktiengesellschaft, Zurich, Switzerland

Filed Oct. 17, 1979, Ser. No. 85,755

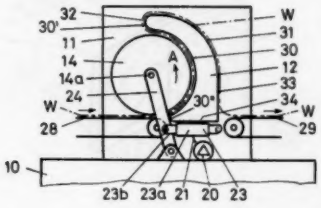
Int. Cl.³ D06F *61/00, 63/00*

U.S. Cl. 38—44 **15 Claims**

1. An ironing mangle, comprising:

a heating member for transferring heat to a fabric which is conveyed thereover, said heating member being disposed in a vertical configuration and including a concave surface having two end edges and which forms a substantially semi-cylindrical cut-out section, and at least one other surface over which said fabric is conveyed for maximizing the heat transfer from said heating member to said fabric; and

a pressing member for applying pressure to said concave surface, in response to a force applied thereto, when said fabric is conveyed thereover,



wherein said two end edges are arranged so that the angle between the plane connecting said end edges and a vertical plane passing through either of said end edges is in the range of 0° to 30° so that the force of gravity acts to disengage said pressing member from said concave surface when said force applied to said pressing member is removed.

4,288,935

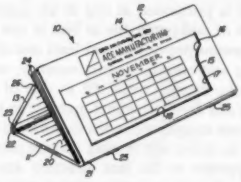
DISPLAY BOOK APPARATUS

Carroll N. Cross, Rte. 2, Box 741, Maitland, Fla. 32751

Filed Nov. 30, 1979, Ser. No. 99,075

Int. Cl.³ G09D *3/04*

U.S. Cl. 40—120 **9 Claims**



1. A display and book combination comprising:

a base panel;

an upright support panel hinged to the back of said base panel with a flexible hinge whereby said upright support panel can be folded flat and angularly moved to an upright position;

a display panel hinged to said base panel and supported on the top edge of said upright support panel when in an upright position and adapted to be folded flat parallel to said base panel and upright support panel when said base panel is folded flat;

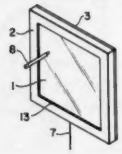
a plurality of book pages secured adjacent to the hinged area between said display panel and said base panel and supported by said upright support panel in an angular position between said upright support and said display panel and adapted to be folded flat between said base panel, upright support panel, and display panel when said upright support panel is folded flat; and

said display panel and said plurality of book pages being selectively rotatable forward whereby the back of said display panels and book pages can be selectively positioned before a user.

4,288,936
WALL-HANGING TYPE MAGNETIC DISPLAYING DEVICE

Hiroyasu Okutsu, Zama, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1979, Ser. No. 83,708
Claims priority, application Japan, Oct. 16, 1978, 53/141982[U]
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—426 **12 Claims**



1. A wall-hanging type magnetic displaying device comprising:

A. A displaying panel comprising:

a. a hanging panel disposed parallel to a panel having a magnetic displaying section incorporating a liquid in which magnetic particles are dispersed, a predetermined space being provided between said hanging panel and said panel having a magnetic displaying section;

b. an erasing magnet member, means for moving said erasing magnet member including means for biasing said erasing magnet member in one direction and, means fixedly secured to at least one of said panels for retaining said biasing means;

c. said erasing magnet member having an elongated magnet arranged with the elongate direction perpendicular to the downward direction of said device hung and connected to one end of said biasing means so that said magnet is positioned at rest at an upper or lower end portion of said panel due to bias in one direction;

d. guide means provided on at least one of said panels for guiding said erasing magnet member; and

e. operating means connected to one of said means for biasing and erasing magnet member so that said operating means extends along the downward direction of the device to move said erasing magnet member in a direction opposite to the bias direction and wherein upon release of said operating means said erasing magnet member reciprocates due to said bias to be restored to the rest position; and

B. a displaying magnet adapted to move the magnetic particles in said dispersed liquid.

4,288,937
DISPLAY STRUCTURE

Gary R. Virsen, Rte. 2, Box 42, Rogers, Minn. 55374

Continuation-in-part of Ser. No. 936,723, Aug. 25, 1978, Pat. No. 4,214,392. This application Oct. 25, 1979, Ser. No. 88,189
Int. Cl.³ G09F *7/00*
U.S. Cl. 40—605 **2 Claims**

1. A display structure comprising, in combination:

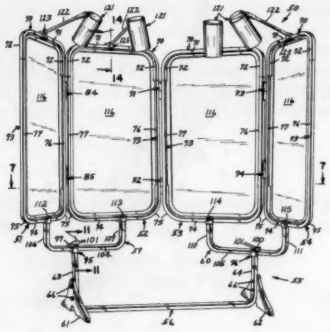
a plurality of rectangular frames pivotally interconnected for angular relative movement about at least one vertical axis, said frames including horizontal bottom frame portions;

a primary U-shaped support;

a secondary U-shaped support having a horizontal bottom portion;

means pivoted in an end of said primary support and slidable along said horizontal portion of said secondary support; and

means pivoted in ends of said secondary support and slidable along said horizontal bottom frame portions, whereby said

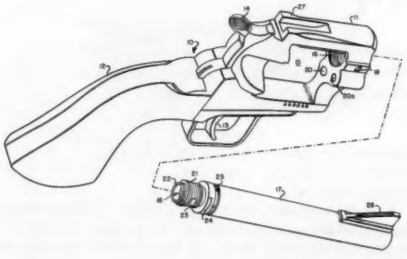


frames are mounted on said supports in angularly adjustable mutual relation.

4,288,938
FIREARM WITH INTERCHANGEABLE BARRELS AND AMMUNITION CYLINDERS

Harvey R. Kahn, Port Jefferson, N.Y., assignor to Alan I. Gerald Corporation, North Haven, Conn.

Filed May 4, 1979, Ser. No. 35,992
Int. Cl.³ F41C *1/00, 21/22*
U.S. Cl. 42—59 **5 Claims**



1. In a firearm of the type having a frame for mounting a multiple chamber ammunition cylinder, said frame having a rear sight mounted thereon, and a threaded frame bore for removably mounting a barrel, a plurality of said ammunition cylinders with each of said cylinders being adapted for use with a different caliber ammunition, means for selectively mounting any one of said plurality of cylinders for revolution on said frame, a plurality of barrels, each said barrel having a different diameter barrel bore therethrough corresponding to a different caliber of ammunition associated with one of said plurality of cylinders, each barrel having a thread engageable in said frame bore and located at one end of said barrel for allowing selective mounting of each said barrel in said frame bore, longitudinal barrel extension means located on said one end of each respective barrel and being operative when said respective barrel is fully threadedly engaged in said frame bore for interfering with the mounting and revolution of any said cylinder in said frame which cylinder corresponds to a caliber of ammunition larger than the caliber of the barrel bore of said respective barrel, an improvement which comprises a plurality of interacting safety features including a barrel alignment mark located adjacent each said barrel thread on each of said barrels, a frame alignment mark located on said frame for alignment with said barrel alignment marks when each said barrel is fully threadedly engaged in said threaded frame bore to insure full

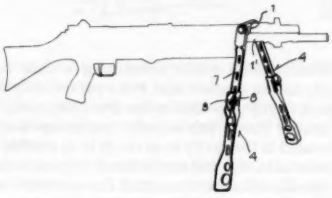
threaded engagement and thereby the operativeness of each said extension means, and a forward sight mounted at the other end of each of said barrels and being operatively oriented with respect to said rear sight for allowing the aiming of said firearm when each respective barrel is fully threadedly engaged in said frame bore, the orientation of each said forward sight thereby also insuring the full threaded engagement of its respective barrel and the operativeness of said extension means.

4,288,939

ADJUSTABLE LEGS SUPPORT FOR AUTOMATIC WEAPONS

Pier C. Beretta, Gardone V.T., Italy, assignor to Fabbrica d'Armi Pietro Beretta S.p.A., Gardone V.T., Italy

Filed Mar. 29, 1979, Ser. No. 25,020
Claims priority, application Italy, Apr. 4, 1978, 6966/78[U]
Int. Cl.³ F41C *29/00*
U.S. Cl. 42—94 **9 Claims**



1. An adjustable leg support for automatic weapons, said support comprising a sleeve defining coupling means that is adapted to engage a tubular part of the weapon, two lateral wings integral with said sleeve, said wings being diametrically opposed to each other and positioned on opposite sides of said coupling means, two elongaged folding rods each having one end pivotally mounted on said wings and angularly displaceable from a parallel position to a perpendicular position with respect to the longitudinal axis of said sleeve, said parallel and perpendicular positions being limited by shoulders provided on said wings, and spring-loaded arresting means mounted on said rods and arranged to engage said wings, each of said folding rods comprising first and second rodlike elements pivotally coupled to each other at their contiguous extremities, the opposite extremity of each said first rod-like element being mounted on said respective wing, each said second rod-like element being adapted to move angularly from an alignment position to a non-alignment position relative to said respective first rod-like element, said opposite extremity of each said first rod-like element being pivoted on a lateral ear of said sleeve and wherein its contiguous extremity includes two arcuate portions that are provided with a plurality of angularly spaced apart notches on the periphery thereof, each said second rod-like element being coupled to said respective arcuate portions on said first rod-like elements by means of a transverse pin, said second rod-like elements each including a spring-loaded, pivotally mounted lever having at least one terminal projection facing toward and engaging one of said notches of said arcuate protions on said first rod-like elements so as to define the angular relationship of said second rod-like elements with respect to said respective first rod-like elements.

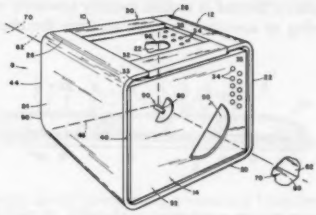
4,288,940

RODENT TRAP GUARD

Rick A. Ensey, Fairfield Bay, Ark. 72088

Filed Mar. 27, 1980, Ser. No. 134,654
Int. Cl.³ A01M *23/00*
U.S. Cl. 43—58 **9 Claims**

1. A rodent trap guard and trap assembly comprising a trap having end walls at least one of which has an entrance opening therethrough, said trap having a top wall having at least one viewing hole therethrough for viewing the interior of the trap from the outside, and a guard, said guard having a hollow housing for receiving a trap comprising a bottom section, right and left side sections, each of said sections being formed of material which is strong enough for substantial rigid protection from collision with forklift trucks and their contents, said right and left side sections extending upwardly from said bottom section, at least one end of said housing a opening in registry



with said trap entrance opening being rodent access, said guard having a top guard section comprising means extending between said right and left side guard sections for covering the top of said trap, said top guard section having a guard viewing opening therethrough disposed in registry with said trap viewing opening, said top guard section being substantially stronger than said trap top section for protective purposes.

4,288,941

TRICK ROPE HAVING APPEARANCE OF WORKING LASSO

James C. Easland, DeSmet, S. Dak., assignor to Easland Industries, Inc., DeSmet, S. Dak.

Filed Mar. 26, 1980, Ser. No. 134,342
Int. Cl.³ A63B *69/00*
U.S. Cl. 46—47 **1 Claim**

1. A trick rope toy comprising a continuous loop consisting of flexible material, said loop being of pre-determined size and having the appearance of the loop of a working lasso, a stem of flexible material, a swiveled handle rotatably fixed at one end of said stem, means affixing the remaining end of said stem to said loop material without the use of attaching pieces to produce an attached loop having good balance while maintaining said appearance.

4,288,942

AERODYNAMIC DEVICE

Thomas H. Nicholl, 1204 W. 27th, Kansas City, Mo. 64108

Filed Aug. 3, 1979, Ser. No. 63,365
Int. Cl.³ A63H *27/00*
U.S. Cl. 46—74 D **6 Claims**

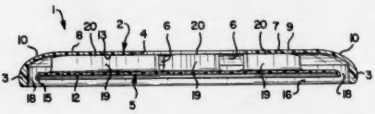
1. An aerodynamic device adapted to provide an upwardly resulting force thereon through rotation of the device about a longitudinal axis thereof comprising:

(a) a first disk member having a central portion and a substantially flat circular surface area whose outer boundary is defined by a predetermined radius, said central portion having an air inlet opening therethrough;

(b) said first disk member having a rim circumscribing said flat circular surface area;

(c) a surface of curvature extending from said boundary and curving downwardly to the point of juncture with said rim to form an upper convex surface and a lower concave surface of the first disk member;

(d) a second impervious disk member spaced apart by means from said first member concave surface such that an outer periphery thereof is spaced radially inwardly of said rim defining an annular discharge aperture therebetween;



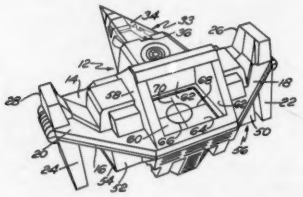
(e) spacer means comprising a plurality of radially spaced impeller vanes positioned between said first disk member concave surface and said second disk member and substantially extending outwardly from said air inlet opening to said discharge aperture; said vanes defining therebetween a plurality of air passages from said air inlet opening to said air discharge aperture such that upon rotation of said device air between said first disk member and said second disk member is urged outwardly by said vanes and discharged downwardly through said air discharge aperture thereby producing a resultant upward force on said device.

4,288,943

SIMULATED FIRING AND SIGHTING SYSTEM

George W. Ptaszek, P.O. Box 260, Pascoag, R.I. 02859, and Robert H. Hudson, 103 Valley St., Seekonk, Mass. 02771

Filed Dec. 5, 1979, Ser. No. 100,487
Int. Cl.³ A63H *27/00*
U.S. Cl. 46—227 **5 Claims**



1. A hobby model simulated aircraft vehicle comprising a fighter fuselage having

stub wings incorporating manual handles, one at either side of said fuselage;

optical focusing means having an axis generally below and generally parallel to the longitudinal extent of the fuselage;

a simulated cockpit having a screen generally parallel to the longitudinal extent of the fuselage above the optical axis of said focusing means to be viewed at right angles thereto from above and having target locating means to transfer a target viewed along the axis of said focusing means at generally right angles thereto onto said screen to be viewed vertically from above;

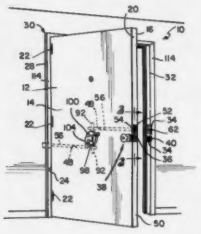
manual means to light said screen to simulate laser firing when the target is desirably focused on the screen by manipulation of said manual handles.

4,288,944

SECURITY DOOR

Terrence P. Donovan, 7834 Providence Cir., Indianapolis, Ind. 46250

Filed Jun. 4, 1979, Ser. No. 44,862
Int. Cl.³ E05C *9/00*
U.S. Cl. 49—395 **17 Claims**



1. A security door system comprising a door having an interior side and an exterior side, and a perimetrally extending door edge, a cavity provided in the door, the cavity opening into the interior side, a bolt actuator mechanism housing, the housing located in the cavity so as not to be accessible from the door exterior side, the bolt actuator mechanism including an actuator spindle and an arm mounted for movement about the spindle axis, the arm including a distal end, a passageway provided between the cavity and the door exterior side, the actuator spindle extending through the first passageway, a passageway provided between the cavity and the door edge for reciprocably housing a bolt, a lost motion connector for connecting the interior end of the bolt to the distal end of the arm, the lost motion connector including a slot in the distal end of the arm, means on the door jamb providing a receiver for the bolt exterior end, exterior and interior handles on the actuator spindle to permit movement of the bolt from the exterior and interior sides of the door, a lock mechanism for selectively inhibiting movement of the actuator mechanism, the lock mechanism including a second bolt for projection into the slot in the distal end of the arm to prevent movement of the arm about the spindle axis, the bolt actuator mechanism housing sized for insertion into the cavity, the actuator mechanism housing being box-like and sufficiently closed to prevent tampering with the actuator mechanism.

4,288,945

REST APPARATUS

Kenichi Munekata, Kariya; Michio Fujita, and Yasuhiro Hattori, both of Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 30, 1979, Ser. No. 98,743
Claims priority, application Japan, Dec. 8, 1978, 53-152196
Int. Cl.³ B24B *41/06*
U.S. Cl. 51—238 S **4 Claims**

1. A rest apparatus for supporting a cylindrical portion of a workpiece to be machined comprising:

a base;

a support head fixedly mounted on said base;

a pilot shaft supported at the opposite ends thereof by said support head and provided with a piston portion;

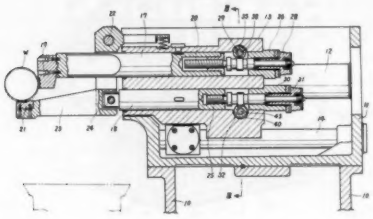
a rest housing having a cylinder bore to form a hydraulic cylinder with said piston portion of said pilot shaft so as to be moved toward and away from the workpiece;

a guide shaft supported at opposite ends thereof by said support head in vertically parallel relationship with said pilot shaft for guiding said rest housing;

a pair of rest shafts slidably but non-rotatably received in said rest housing in parallel laterally offset relationship with said pilot shaft;

a pair of rest shoes operatively connected to one of the ends

of said pair of rest shafts for horizontally and vertically supporting the workpiece, a first one of said rest shoes including a first support area for the horizontal support of said workpiece and a second one of said rest shoes including a second support area for the vertical support of said work, said first support area being adapted to support said workpiece in a horizontal plane located in a range extending from the axis of said workpiece to the vertical height immediately above said axis; and



feed means operatively connected to said pair of rest shafts for feeding said pair of rest shoes toward the center of the workpiece,

wherein the axis of said pilot shaft is in a horizontal plane which lies between said rest shafts and intersects said first support area.

4,288,946

PRECISION BLOCKING OF LENS BLANKS

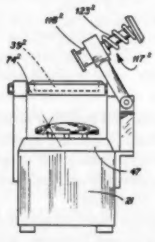
Bela J. Bicskei, 7 Hemenway Rd., Framingham, Mass. 01701

Continuation-in-part of Ser. No. 956,244, Oct. 31, 1978, Pat. No. 4,227,349. This application Jan. 26, 1979, Ser. No. 6,689

The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—284 E **5 Claims**



1. The method of blocking a lens blank at a prescribed optical position comprising the steps of:

(a) adjusting a lens blank in an instrument until said lens blank satisfies a prescribed optical condition; and

(b) pivoting a pivotable member of said instrument from the side thereof to said lens blank without disturbing the position of said lens blank; and

(c) using a plunger mechanism of said pivotable member to bring a releasable block and a double-faced adhesive strip into contact with the lens blank to adhesively secure the block to the blank.

4,288,947

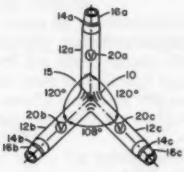
MODULAR INFLATABLE DOME STRUCTURE

Yen T. Huang, 9405 Pinewood Dr., Dallas, Tex. 75231

Filed Aug. 28, 1978, Ser. No. 937,483

Int. Cl.³ E04B *1/32*

U.S. Cl. 52—2 **6 Claims**



1. A joining device comprising connecting branches extending from a central axis to form a rigid Y shape forming acute angles from the plane perpendicular to a vertical axis through the vertex of the Y, the branches forming angles of 120°, 120°, and 108°, with one another, and further comprising a female groove on each branch and a sealing ring to fit into the female groove over any material sought to be connected to the branch.

4,288,948

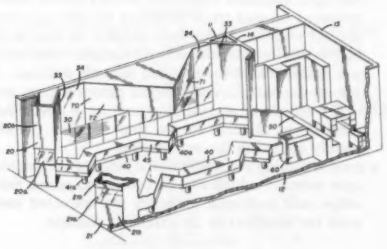
RETAIL STORE

Ronald J. Harris, Toronto, Canada, assignor to Sterling Merchandise Co., Akron, Ohio

Filed Feb. 15, 1980, Ser. No. 121,831

Int. Cl.³ E04H *3/04*

U.S. Cl. 52—28 **8 Claims**



1. A store for retail sales, comprising;

(A) perimeter walls enclosing at least two sides of the store area;

(B) wall cases disposed along at least a portion of said perimeter walls;

(C) a plurality of freestanding show cases

(1) spaced from said perimeter walls and

(2) being disposed in end to end relationship so that their faces form an irregular pattern;

(D) a ceiling bearing a reflective surface; and

(E) a canopy

(1) suspended from said ceiling in overhanging relationship with at least some of said freestanding show cases

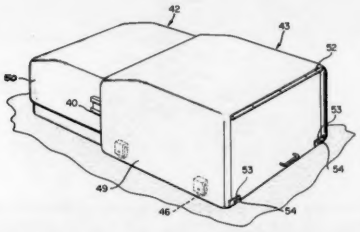
(2) and having a configuration conforming to at least a portion of the irregular pattern formed by said show cases.

4,288,949

MODULAR GARAGE STRUCTURE

John Latimer, 903 S. Ashland, Apt. 1007-B, Chicago, Ill. 60607

Filed Jul. 18, 1979, Ser. No. 58,722
Int. Cl.[3] E04B *1/343;* E04H *6/04*
U.S. Cl. 52—67 **2 Claims**



1. A garage for a vehicle having a front end and a rear end comprising:

a two piece contoured structure having a first stationary enclosure member and a second movable enclosure member;

said first stationary enclosure member having a top and two longitudinal contoured sidewalls and a transverse contoured end wall adjoining said sidewalls, said first member being open at one transverse end and cross-sectionally and longitudinally dimensioned to receive the front of the vehicle;

said second contoured enclosure member having a top and two longitudinal sidewalls being open at both transverse end., and having a slightly larger cross-sectional dimension than said first member;

a U-shaped base plate having two longitudinal extensions projecting along the sidewalls and beyond the open transverse end of said first member to serve as a frame work for transporting the garage from location to location and further having means for anchoring the base plate to the ground in a fixed location;

track members carried by the extensions of said base plate and slide members connected to said second member and mounted on said track members slidably connecting the second member to the first member so that an operator can manually slide the second member from a retracted position in which the first and second enclosure members are substantially overlapping to permit ingress and egress of the vehicle, to an extended position in which the second member is adjacent to the first member thereby completely enclosing the vehicle; and

a door adjoining the longitudinal sides of the second enclosure member which can be opened to admit the vehicle when said enclosure members are retracted and closed with the members in the extended position.

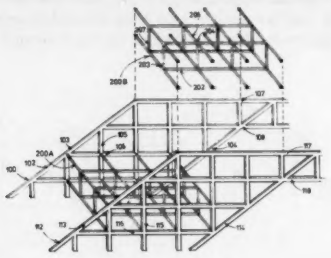
4,288,950

MULTIPLE-BUILDING CONSTRUCTION SYSTEM AND METHOD OF ERECTING SAME

Abraham Agassi, 28 King David St., Tel Aviv, and Amnon Levy, Kibbutz Givat, Chaim-Ihud, both of Israel

Filed Aug. 30, 1979, Ser. No. 63,415
Int. Cl.[3] E04H *1/04*
U.S. Cl. 52—79.12 **19 Claims**

1. A three-dimensional multiple-building construction system for a plurality of three-dimensional, multiple-room housing units, characterized in that said system comprises a three-order hierarchy of frame members, the first order frame members including a superstructure framework channelling substantially the complete load of the system to the ground, the second order frame members including at least one intermediate box-like framework defining a three-dimensional open grid of beams and columns, the third order frame members including further beams and columns attached to the beams and columns of the intermediate block-like framework and define components of the plurality of three-dimensional multiple-room housing units, such that the load of the housing units



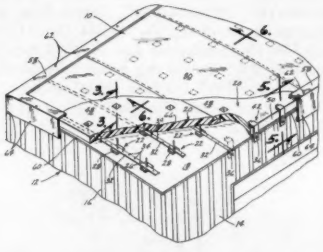
attached to the third order frame members are transmitted from the latter members to the second order frame members, from the latter to the first order frame members, and from the latter to the ground.

4,288,951

AUXILIARY INSULATED ROOF SYSTEM

Denny L. Carlson; David C. Brissey, both of Iowa City, and Lee W. Vriezelaar, Pella, all of Iowa, assignors to Scientific Applications Incorporated, Mount Pleasant, Iowa

Filed Nov. 14, 1979, Ser. No. 94,222
Int. Cl.[3] E04B *7/00;* E04D *13/16*
U.S. Cl. 52—94 **13 Claims**



3. In combination with a building structure including opposite upstanding sid. walls, opposite upstanding end walls and a roof surface operatively connected to and extended between upper ends of said sidewalls and end walls, an auxiliary insulated roof structure comprising

a generally continuous panel structure of insulation material,

support means interposed between said panel structure and roof surface for maintaining said panel structure in clearance relation above said roof surface, and

fastening means secured to said panel structure and building sidewalls for fixing said panel structure in position on said roof surface,

said support means comprising a plurality of insulated support blocks,

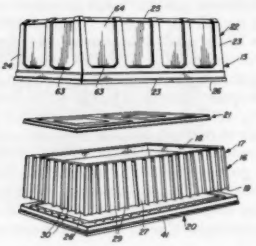
each block comprising a base plate, an elongated stud secured to and extended from one side of said base plate at a generally perpendicular angle thereto, and a block of insulation material secured to the opposite side of said base plate.

4,288,952

BURIAL VAULTS

Gerald L. Work, Spokane, Wash., assignor to Wilbert, Inc., Forest Park, Ill.

Filed Nov. 27, 1979, Ser. No. 97,716
Int. Cl.³ E04H *13/00*
U.S. Cl. 52—138 **16 Claims**



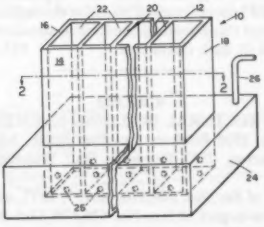
1. A burial vault comprising:
(a) a composite base including
(1) a generally flat and rectangular-shaped supporting platform having
a. an upper surface; and including
1. a main body portion having
(a) a generally horizontally extending marginal or peripheral flange extending outwardly therearound and having
(b) a downwardly and generally vertically extending marginal or peripheral flange surrounding the said main body portion of the said generally flat and rectangular-shaped supporting platform
(2) an inner upright wall structure having a generally rectangular-shaped frame resting on the said upper surface of the said generally horizontally extending marginal or peripheral flange portion of the said main body portion of the said supporting platform; and including
a. generally vertically extending side walls; and
b. generally vertically extending end walls;
c. the said generally vertically extending side walls and end walls of the said inner upright wall structure having lower marginal or peripheral edge portions; and the said inner upright wall structure having
d. an open upper end or top; and
e. an open lower end; and including
f. a generally horizontally extending marginal or peripheral flange portion extending around and laterally outwardly from the said lower marginal or peripheral edge portions of the side walls and end walls of the said inner upright wall structure;
(3) a generally flat and rectangular-shaped closure plate member arranged over and closing the said open upper end or top of the said generally rectangular-shaped frame of the said inner upright wall structure;
(b) a dome-shaped outer cover member arranged over and enclosing the said inner upright wall structure and the said supporting platform; and including
(1) generally vertically extending side walls and end walls and the said side walls and end walls of the said dome-shaped outer cover member having
a. lower and downwardly extending marginal or peripheral edge portions extending below and outwardly of the said main body portion of the said generally flat and rectangular-shaped supporting platform and outwardly of the said generally horizontally extending marginal or peripheral flange portion of the said inner upright wall structure and outwardly of the said downwardly and generally vertically extending marginal or peripheral flange of the said main body portion of the said generally flat and rectangular-shaped supporting platform;
(2) a closed top wall; and having
(3) an open bottom;
(c) first sealing means for hermetically sealing the said generally rectangular-shaped frame of the said inner upright wall structure to the said generally flat and rectangular-shaped supporting platform;
(d) first fastening means for mechanically fastening the said generally horizontally extending marginal or peripheral flange portion of the said generally rectangular-shaped frame of the said inner upright wall structure to the said generally horizontally extending marginal or peripheral flange of the said generally flat and rectangular-shaped supporting platform;
(e) second sealing means for hermetically sealing the said dome-shaped outer cover member to the said generally flat and rectangular-shaped supporting platform;
(f) second fastening means for mechanically fastening the said lower and downwardly extending marginal or peripheral edge portions of the dome-shaped outer cover member to the said downwardly and generally vertically extending marginal or peripheral flange of the said main body of the said generally flat and rectangular-shaped supporting platform; the said generally rectangular-shaped frame of the said inner upright wall structure having
(g) marginal or peripheral upper edge portions; the said closure plate member including
(h) marginal or peripheral outer edge portions having formed thereon
(1) an inverted and generally U-shaped marginal or peripheral flange having formed therein
(2) a marginal or peripheral downwardly facing groove; and
(i) the said marginal or peripheral upper edge portions of the said generally rectangular-shaped frame of the said inner upright wall structure extending into the said downwardly facing marginal or peripheral
groove in the said inverted and generally U-shaped marginal or peripheral flange on the said closure plate member.

4,288,953

THERMAL AND OPTICAL MULTI-MODE WINDOW

Carl Whiteford, 3 High Point Rd., Westport, Conn. 06880

Filed May 15, 1980, Ser. No. 150,208
Int. Cl.³ E06B *7/12*
U.S. Cl. 52—171 **7 Claims**



1. A thermal and optical multi-mode window comprising:
A. A window panel constructed to be dimensionally and structurally received within a window frame and normally adopted to be retained therein, said window panel comprising
(1) a plurality of layers of relatively thin transparent material disposed in spaced apart parallel relationship, and
(2) a plurality of transversely disposed, spaced apart web members formed of the same material as said layers of material and extending between said layers of material

thereby dividing the space between said layers of material into a plurality of spaced apart voids,

B. a source of clear liquid having an index of refraction which is matched to the index of refraction of said material,

C. means providing liquid flow communication between said liquid source and said plurality of voids, and

D. means for causing said liquid to flow from said liquid source into said voids to fill the latter whereby said window panel changes from optically diffuse to optically clear.

4,288,954

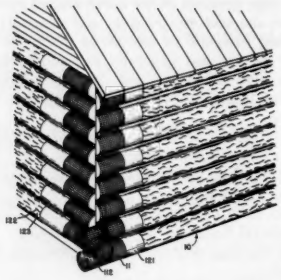
SIMULATED LOG SIDING

Royce L. O'Donnell, 2721 E. Kelton La., Phoenix, Ariz. 85032

Filed Oct. 4, 1979, Ser. No. 81,650

Int. Cl.[3] E04B *1/10;* **E04C** *2/26*

U.S. Cl. 52—233 **6 Claims**



1. The method of simulating a log wall siding comprising the steps of:

forming a skeletal structure to the general configuration associated with lengths of log used in a log wall structure;

applying a first coating to said skeletal structure, said first coating having a light color serving to simulate caulking between logs;

applying a second coating over said first coating, avoiding the region between logs which is normally caulked, said second coating having a dark color serving to simulate the shadowed interior of the bark interstices of a natural log; and

applying a third but open-coat over said second coating said third coating having a color serving to simulate the bark of a natural log, said open-coat application serving to allow said second coating to show through such that said second and third coating combine to simulate the effect of bark and its dark interstices.

4,288,955

STRUCTURAL BUILDING ELEMENT

Carl C. Hiatt, 2500 Roxbury La., Fort Smith, Ark. 72903, and Nils L. Larson, 7837 Reynolda Sta., Winston-Salem, N.C. 27109

Continuation of Ser. No. 849,510, Nov. 7, 1977, abandoned, and a continuation-in-part of Ser. No. 625,478, Oct. 24, 1975, Pat. No. 4,056,910. This application Jun. 5, 1979, Ser. No. 45,681

Int. Cl.[3] E04B *5/00*

U.S. Cl. 52—309.1 **26 Claims**

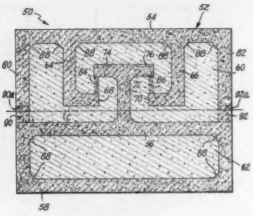
1. A building element comprising:

(a) a continuous phase of cementitious material including:

1. a matrix having a first density, and

2. at least one zone dispersed within the matrix having a second density lower than the first density, wherein said continuous phase of cementitious material extends throughout said matrix and said lower density zone; and wherein

(b) the matrix includes a first wall section and a generally parallel and opposing second wall section, said first wall section having at least one first lateral section extending away therefrom at least half the distance between said first and second wall sections but terminating short of said opposing second wall section at a lower density zone disposed between the terminal end of the lateral section and the second wall section, and said second wall section



having at least one second lateral section, spaced longitudinally from said first lateral section, extending away therefrom at least half the distance between said first and second wall sections but terminating short of said opposing first wall section at a lower density zone disposed between the terminal end of the lateral section and the first wall section.

4,288,956

INSULATING-SLABS AND THEIR USE

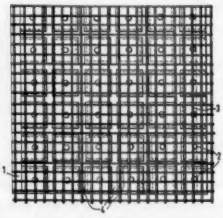
Friedrich Heck, Heckenpfad 15, Bad Dürkheim, Fed. Rep. of Germany

Filed Mar. 14, 1979, Ser. No. 20,509

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850861

Int. Cl.[3] E04B *1/62;* **E04C** *2/22;* **E04B** *1/80;* **E04F** *13/04*

U.S. Cl. 52—309.12 **29 Claims**



1. A hard-foam plastic slab having two major surfaces, one of which has:

(a) plural grooves and lands between adjacent grooves,

(b) fastening elements which have a base and a head end and also serve as spacers, which are secured at their bases to the lands and are dispersed at intervals over the one surface, and

(c) a reinforcing web affixed to the head ends of the fastening elements at a substantially uniform distance from said one surface.

4,288,957

FLOOR SYSTEM

M. Dennis Meehan, St. Louis County, Mo., assignor to The Binkley Company, Warrenton, Mo.

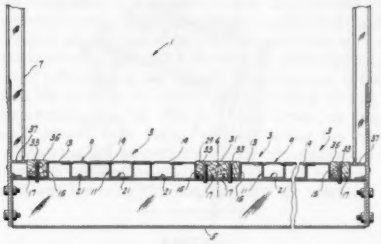
Filed Jun. 7, 1979, Ser. No. 46,331

Int. Cl.[3] E04B *5/00;* **B62D** *25/20*

U.S. Cl. 52—460 **10 Claims**

1. A floor system for a trailer or the like comprising a plural-

ity of elongate sheet metal floor panels extending side-by-side lengthwise of the trailer across substantially the entire width of the trailer on floor supporting means of the trailer, each of said metal floor panels comprising upper and lower panel means, said upper panel means comprising an upper panel member having a relatively wide web member above said floor supporting means, a pair of flanges extending down from the web member at opposite sides of the web member, and a pair of relatively narrow fastening lips extending laterally outwardly from the flanges at the lower edges of the flanges and bearing on said floor supporting means, said lower panel means comprising a series of channel sections on the underside of the web member of the upper panel member and extending longitudinally of the latter, each channel section comprising a web bearing on said floor supporting means and flanges extending up from the web at opposite sides of the web to the underside of the web member of the upper panel member, said floor panels being mounted on said floor supporting means one alongside another from one side of the trailer to the other with the relatively narrow fastening lips at adjacent sides of adjacent floor panels being relatively closely adjacent one another



for defining, in conjunction with the opposing flanges extending up from the fastening lips, upwardly opening generally rectangular recesses extending longitudinally of the trailer between adjacent floor panels, said recesses being substantially narrower than the sheet metal floor panels and spaced at substantially equal intervals transversely with respect to the trailer from one side of the trailer to the other, wood flooring members substantially narrower than said floor panels extending longitudinally in said recesses between adjacent floor panels and bearing on the lips, said flooring members projecting upwardly above the web members of said upper panel members, fasteners extending through the wood flooring members for fastening the latter to said floor supporting means, a pair of outboard wood flooring members extending longitudinally of the trailer at opposite sides of the floor system adjacent the sides of the trailer, said outboard wood flooring members being substantially narrower than the sheet metal floor panels and bearing on the fastening lips at the outboard sides of the floor panels adjacent the sides of the trailer, and fasteners extending through said outboard wood flooring members for fastening said members to the floor supporting means.

4,288,958

HORIZONTAL SIDING PANEL SYSTEM WITH VERTICAL STRINGERS

Alexander A. Chalmers, Warren, and J. Lynn Gailey, Newton Falls, both of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Jun. 18, 1979, Ser. No. 49,850
Int. Cl.³ E04D *1/06, 3/362*
U.S. Cl. 52—478 **13 Claims**

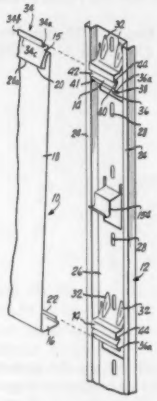
1. A siding system comprising

(a) a plurality of vertically elongated stringers each having a plurality of outwardly projecting and downwardly opening resilient clips spaced at regular intervals along its length, and

(b) a plurality of horizontally elongated siding panels each having a top margin with an outwardly and downwardly projecting longitudinal lip extending therealong and a bottom margin bent inwardly and then upwardly to provide an upwardly opening longitudinal channel flange on the inner side of the panel,

(c) said stringers being mounted in spaced parallel relation on a wall and so aligned with each other that their respective clips are in horizontal rows, and

(d) said panels being disposed in parallel overlapping array, one above another, outwardly of said stringers on said wall, with the top margin of each panel inserted under and held by a horizontal row of the clips and the channel



flange of the panel interlocked with the lip of the next lower panel in the array;

wherein the improvement comprises:

(e) each of said panels having a longitudinal locking projection extending along the top margin of the panel and spaced above the lip thereof, and

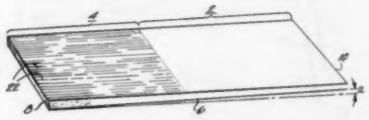
(f) the inner surface of each of said clips defining two vertically spaced inwardly opening locking seats for successively engaging the locking projection of a panel when the panel top margin is inserted progressively upwardly under the clip.

4,288,959

ROOFING OR SIDING ARTICLE

John B. Murdock, 10 Manchester Rd., Moylan, Pa. 19065

Filed May 21, 1979, Ser. No. 40,587
Int. Cl.³ E04D *1/28*
U.S. Cl. 52—518 **7 Claims**



1. A weather and fire-resistant roofing or siding article such as a shingle or panel having high thermal insulation value, comprising:

(a) a body having opposed inner and outer surfaces composed of insulating board comprising fiber, binder and about 50 to about 90% by weight expanded perlite;

(b) said body having a butt section and an adjacent nailing section, the butt section being substantially uniformly the maximum thickness of the article and having a non-tapered outer surface to be exposed to the weather, said nailing section being of the same thickness as the butt

section at the juncture with said butt section, having a non-tapered outer surface, and having an inner surface tapered in thickness in a portion thereof from said maximum thickness to a minimum thickness at one edge thereof remote from said juncture; and

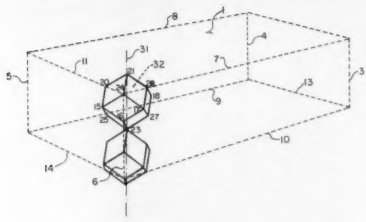
(c) a water and weather-resistant coating comprising asphalt and roofing granules on the outer surface of said uniform thickness butt section to be exposed to the weather.

4,288,960

INTERLOCKING BUILDING BLOCK

Olivier W. Auras, 2 Rue Du Nord, Martigny (Valais), Switzerland (1920)

Filed Aug. 1, 1977, Ser. No. 820,671
Int. Cl.³ E04B *5/04;* E04C *2/04*
U.S. Cl. 52—604 **4 Claims**



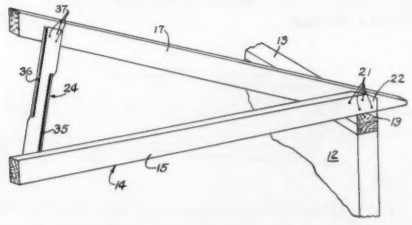
1. A building block having the general shape of a six sided rectangular solid and an outline corresponding to the agglutination of a plurality of interlocked identical elements each having the form of a symmetrical rhombic dodecahedron wherein each said rhombic dodecahedron is positioned so that two of its diagonally opposite vertices are in an axis parallel to a first edge of said rectangular solid and each of the faces parallel to said axis is in a plane forming a forty-five degree angle with the other edges of said rectangular solid which are perpendicular to said first edge.

4,288,961

RIGID STEEL BRACE FOR OFFSET TRUSSES

Kenneth T. Snow, Jr., 837 Prince Charles La., Schaumburg, Ill. 60195, and Robert N. Snow, 1631 Mulberry Ct., Elgin, Ill. 60120

Filed Mar. 24, 1980, Ser. No. 132,833
Int. Cl.³ E04B *7/08*
U.S. Cl. 52—738 **1 Claim**



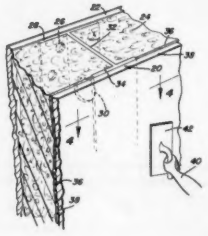
1. A brace for reinforcing an offset truss at a location spaced intermediate the heel joint of cross tie joist and roof rafter and a centrally disposed ridge board at the top center of the truss, comprising, a generally narrow elongated steel strip, said strip formed with a deep concave rib running longitudinally thereof and extending from a first end to a location beyond the center of the strip but stopping short of the other second end of said strip, said strip further formed with a deep convex rib disposed generally parallel to and spaced laterally from said concave rib and extending from the second end to a location beyond the center of the strip but stopping short of the first end of the strip, the first end of said strip having a flat surface on the top side thereof and the second end of said strip having a flat surface on the other under side thereof, means attaching the flat surface on one side of the strip at one end to the side of the roof rafter and means attaching the flat surface on the other side of the strip at the other end to the side of the cross tie joist.

4,288,962

METHOD OF FORMING STRUCTURAL WALLS AND ROOFS

Harvey H. Kavanaugh, 17 W. Cervantes St., Pensacola Beach, Fla. 32501

Filed Feb. 27, 1979, Ser. No. 15,732
Int. Cl.³ B32B *3/26;* E04C *2/26;* E04B *1/76*
U.S. Cl. 52—743 **1 Claim**



1. The method of forming a structural wall in place comprising the following steps:

(a) erecting vertically in spaced relation a plurality of support studs;

(b) placing a section of plasterboard on the side of the support studs facing the interior side of the structural wall;

(c) spraying a layer of high density expanded cellular foam to the plasterboard from the side exterior to the structural wall to substantially fill the space between the studs;

(d) allowing the foam layer to cure to form a solid insulating layer;

(e) spraying a layer of bonding agent over the exterior exposed surface of said insulating layer so that the inner surface of the bonding agent and stud are coplanar;

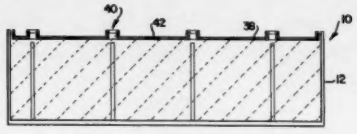
(f) spraying a layer of cementitious material to said bonding agent and inner surface of the stud in a continuous thickness of at least one-half inch without including reinforcements; and

(g) allowing said cementitious layer to cure to form a smooth, hard, durable exterior wall layer, said support stud being a metal I-beam having substantially parallel flanges in the plane of said structural wall, the flanges being joined by a web, the I-shaped beam being of unitary construction, said cementitious material being a mixture of Portland cement, hydrated lime, calcium chloride, calcium stearate, and alkali-resistant fiber glass filaments approximately one-half inch in length, and said expanded cellular foam is a polyurethane synthetic resin, said metal stud being aluminum and the outer flange having a width less than the width of the interior flange, the interior flange being perforated to facilitate bonding of the plasterboard with the foam layer, said inner perforated flange having a plurality of perforations in staggered configuration along the I-shaped beam, and the web of said beam is perforated to allow passage therethrough of electrical conduit, plumbing and the like.

4,288,963
TRIANGULAR COLUMN ARRANGEMENT AND METHOD

Gysbert J. R. van der Meulen, 14 Floor, The Strand Tower, 66 Strand St., Cape Town, Cape Province, South Africa

Filed Mar. 27, 1979, Ser. No. 24,423
Claims priority, application South Africa, Mar. 30, 1978, 78/1818
Int. Cl.³ E04G 21/14
U.S. Cl. 52—745 2 Claims

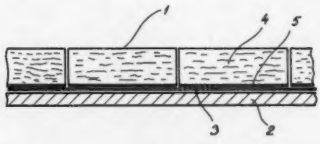


1. A method of erecting a roof slab, comprising casting a plurality of structural support columns at the vertices of contiguous, congruent, equilateral triangles, the columns extending upwardly from a base, and casting a roof slab on said base, the columns passing upwardly through apertures in the slab, the roof slab being cast with a plurality of reinforced zones the centres of which are at the vertices of contiguous, congruent, triangles, the plurality of reinforced zones being arranged in a pattern reproducing the pattern of apertures but displaced circumferentially with respect thereto, lifting the roof slab with respect to the base until it is clear of the columns, rotating the roof slab until each reinforced zone is above one of the columns, and lowering the roof slab onto the columns.

4,288,964
METHOD FOR THE INSULATION OF ROOFS

Jorgen S. Petersen, Roskilde, Denmark, assignor to Rockwool International A/S, Hedehusene, Denmark

Filed Mar. 19, 1979, Ser. No. 21,758
Claims priority, application Denmark, Mar. 12, 1978, 1261/78; Jun. 15, 1978, 2693/78
Int. Cl.³ E04B 5/00
U.S. Cl. 52—747 5 Claims



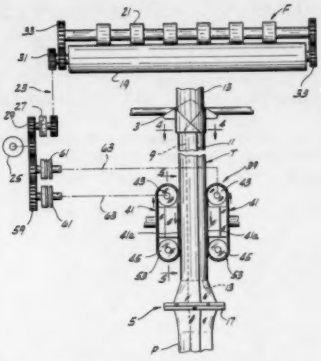
1. In a method for insulating roofs having a water-impermeable membrane on the exposed surface thereof whereby insulating material, in the form of slabs, is placed on top of the water-impermeable membrane; the improvement which comprises utilizing insulating slabs consisting of mineral wool with fibres which are mutually bonded at their intersections by means of a resin and wherein the surfaces of the slabs facing the water-impermeable membrane are provided with a vapour-impermeable foil.

4,288,965
FORM-FILL-SEAL PACKAGING METHOD AND APPARATUS

Robert C. James, Sheboygan, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Aug. 27, 1979, Ser. No. 69,828
Int. Cl.³ B65B 9/06, 57/04
U.S. Cl. 53—451 32 Claims

1. The method of forming, filling and sealing packages wherein a web of flexible packaging material is pulled from a supply and fed over means for forming it into tubing, and wherein product to be packaged is provided in the tubing and sealing operations are performed on the tubing to seal it to form packages, characterized in that the web is pulled from the supply, measured for each sealing operation, and fed toward the forming means by applying a forward force to the web

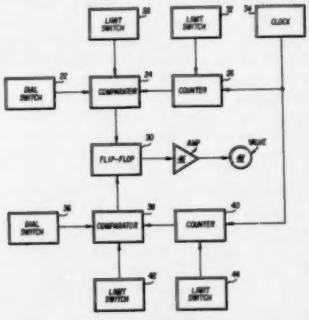


between the supply and the forming means, and a forward force is applied separately to the tubing to draw the tubing forward, the latter force being applied to the tubing at a rate such as to pull the material forward over the forming means with the material under tension to maintain it taut, the measurement of the web for each sealing operation being effected before the forming of the web by the forming means.

4,288,966
METHOD OF VACUUM TIMING CONTROL

Dwight W. Aten, Lebanon Township, Warren County, N.J., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed Jul. 3, 1979, Ser. No. 54,509
Int. Cl.³ B65B 43/00
U.S. Cl. 53—469 10 Claims



1. A method for inserting material into an envelope using an inserting machine, said envelope having a front panel, a back panel, and a flap connected to said front panel to overlap said back panel, the method including the steps of:

transporting the envelope towards an inserting station of said machine on a transport means of said machine;

deflecting at least portions of selected pieces of insertion material from stacks of insertion material respectively contained at a plurality of insertion supply stations proximate said transport means, said deflection being accomplished by applying to said selected pieces for a period of time a vacuum, said vacuum being applied through a

suction means situated at each insertion supply station of said machine;

extracting said selected pieces from each insertion supply station and depositing said selected pieces on said transport means;

inserting said selected pieces into said envelope at said inserting station; and,

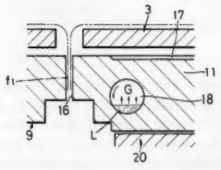
selectively adjusting for each individual insertion supply station the period of time for the application of said vacuum through said suction means.

4,288,967

CENTER SEALING DEVICE FOR A PLASTIC FILM IN A PACKAGING APPARATUS

Kiyoshi Seko, Nagoya, and Mamoru Ichikawa, Aichi, both of Japan, assignors to Fuji Machinery Co. Ltd. and Japan Packaging Machinery Manu. Assn., both of, Japan, part interest to each

Filed Nov. 30, 1979, Ser. No. 98,720
Int. Cl.³ B65B *51/26, 9/06, 51/28*
U.S. Cl. 53—550 **5 Claims**



1. In a center sealing device for a packaging apparatus including a pair of rotatable heating roller means placed on a feeding path of a continuous cylindrical film spacedly containing products and capable of being sealed by heat, said heating roller means holding lapped axial ends of said film therebetween for continuously sealing said ends of every two adjacent packages by heat, said heating roller means comprising:

outer peripheral surfaces having a predetermined width for contacting said lapped ends of said film and sealing the same by heat;

a sealed chamber substantially uniform in section thereof in each of said heating roller means in the vicinity of said roller means adjacent to said outer periphery and extending coaxially along the entire circumference thereof, said chamber being at a reduced pressure;

a heat transferring working liquid sealedly introduced into said sealed chamber to partially fill said chamber;

a heat source adjacent to each of said heating roller means and said sealed chambers for vaporizing said working liquid;

said vapor from said working liquid being condensed on the upper inner wall surface of said sealed chamber so as to discharge condensed latent heat for substantially maintaining said outer peripheral surfaces at a predetermined temperature.

4,288,968

END SEALING DEVICE FOR A PLASTIC FILM IN A PACKAGING APPARATUS

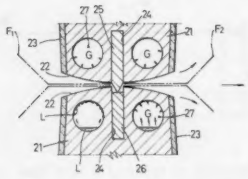
Kiyoshi Seko, Nagoya, and Mamoru Ichikawa, Aichi, both of Japan, assignors to Fuji Machinery Co., Ltd. and Japan Packaging Machinery Manu. Assn., both of, Japan, part interest to each

Filed Dec. 3, 1979, Ser. No. 99,847
Int. Cl.³ B65B *51/30, 51/28, 9/06*
U.S. Cl. 53—550 **6 Claims**

1. In an end sealing device for a packaging apparatus including a pair of heat sealing members placed on a feeding path of a continuous cylindrical film spacedly containing products and capable of being sealed by heat, said heat sealing members holding said film therebetween for successively sealing ends of every two adjacent packages by heat, said heat sealing members comprising:

heat sealing surfaces for sealing said ends of every two adjacent packages and being longer in width than said cylindrical film;

a sealed chamber provided in each of said heat sealing members adjacent said heat sealing surface along substantially the entire length thereof, said sealed chamber being maintained at a reduced pressure;



a heat source provided within said heat sealing member; and

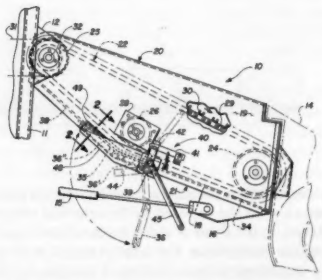
a heat transferring working liquid sealedly introduced into said sealed chamber so as to partially fill said chamber, said liquid being heated by said heat source to generate a high temperature condensable gas, said condensable gas of said working liquid being condensed in the inner wall surface of said sealed chamber nearest said heat sealing surface contacting said film so as to discharge condensed latent heat for maintaining the entire heat sealing surface at a substantially constant temperature.

4,288,969

STONE TRAP SEAL

Kenneth R. Underhill, Strasburg, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Mar. 31, 1980, Ser. No. 135,841
Int. Cl.³ A01F *12/10*
U.S. Cl. 56—10.2 **5 Claims**



1. In an infeed housing attachable on a first inlet end to a harvesting attachment and on a second outlet end to a combine having two opposing sidewalls connecting a top surface and a bottom surface thereby defining a flow passage for crop material, the bottom surface further having a trapdoor mounted thereto moveable between a first closed position and a second opened position and cooperative with the bottom surface and a foreign object detecting system to selectively create a discontinuity in the flow passage for the ejection of detected foreign objects, the improvement comprising:

sealing means formed into each of the opposing sidewalls and cooperative with the trapdoor in the closed position to prevent the loss of crop material therebetween during the operation of the combine, the sealing means further comprising an elongate indentation in each of the oppos-

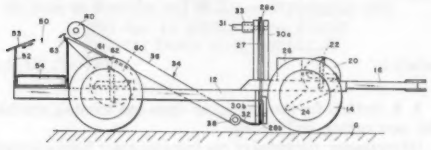
ing sidewalls having an inner surface and an outer surface, the inner surface being of predetermined radius nearest the trapdoor, said trapdoor having first and second opposing edges adjacent the opposing sidewalls, the distance between said opposing indentations being less than the distance between said first and second edges of said trapdoor, so that both said first and second edges of said trapdoor engage the respective said indentation when said trapdoor is moved to said first closed position to seal said trapdoor and prevent the escape of crop material between said first and second edges and the respective said sidewall during the passage of crop material over said bottom surface.

4,288,970

ASPARAGUS HARVESTER

Lewis L. Wilde, 17139 Bailey Rd., Bailey, Mich. 49303

Filed Sep. 7, 1979, Ser. No. 73,556
Int. Cl.³ A01D *45/00*
U.S. Cl. 56—327 A **3 Claims**



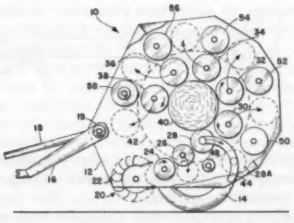
2. An asparagus harvester comprising a vehicle, a recirculatory bandsaw stalk cutter at the front of said vehicle, with its lower pass horizontal, cutter cleaning means downstream of said cutter lower pass for cleaning said cutter of dirt and debris, said cutter cleaning means being driven in engagement with said cutter, an elevator conveyor to the rear of said lower pass, front blower means above and forwardly of said lower pass, with its outlet directed rearwardly generally toward said lower pass, to transfer cut asparagus stalks to said elevator conveyor, hopper means beneath the discharge end of said elevator conveyor, debris separator means between said discharge end and said hopper means comprising a separator blower having a controlled outlet nozzle oriented upwardly and rearwardly beneath said discharge end for blowing falling debris away from falling asparagus stalks.

4,288,971

ROUND BALER

John R. McClure, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Apr. 2, 1980, Ser. No. 136,668
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **7 Claims**



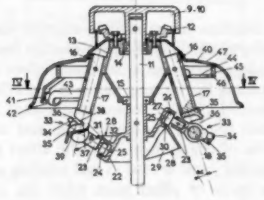
1. In a round baler machine for forming cylindrical bales of windrowed agricultural crop material comprising a wheel mounted frame, power means and means for raising the crop onto the frame and into contact with multiple rotating rollers which impart motion to the crop material to form a bale of cylindrical shape completely enclosed within the machine, the improvement comprising: means for shifting at least a portion of the rollers from a closely grouped position at the beginning of the formation of the bale to a position of expanded grouping as the final size of the bale is reached; and means for restraining the shifting rollers in their expansion paths to create compressive force on the bale wherein the final expanded grouping position of the shifting rollers is such that they act in cooperation with the stationary rollers to rotate and compress the bale in its final size and position.

4,288,972

HAYMAKING MACHINES FOR TEDDING AND WINDROWING

Guy Rostoucher, Saverne, France, assignor to Kuhn S. A., Saverne, France

Filed Apr. 1, 1980, Ser. No. 136,398
Claims priority, application France, Apr. 6, 1979, 79 09250
Int. Cl.³ A01D *79/00*
U.S. Cl. 56—370 **10 Claims**



1. A haymaking machine for tedding and windrowing, comprising in combination:

a frame,

at least one raking wheel drivably mounted on said frame for rotation about a center axis,

cam means centered about said center axis, forming an endless loop within a predetermined axial range therearound, and rigid with said frame,

a plurality of support bearings,

a plurality of tool-carrying arms operatively connected to said raking wheel and mounted in said support bearings, respectively, said arms being switchable between

a tedding position, in which said arms project radially outwards, and

a windrowing position, in which said arms extend in a direction substantially tangential of a circle inscribed in said raking wheel,

each arm being oscillatable about its longitudinal axis, and including cam follower means connected near the inner end of each arm,

guidance means adjacent said cam means for guiding each cam follower means into engagement with said cam means in said windrowing position from any position occupied by each cam follower means near the periphery of said cam means, and

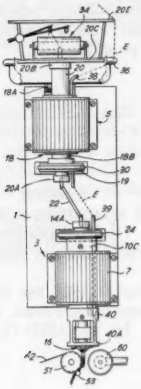
guide means, including a pin disposed at an end of each tool-carrying arm, facing said center axis, and stop means located near said axis and provided with a guide slot for receiving said pin,

whereby each arm operatively oscillates about its longitudinal axis within a predetermined angle in said windrowing position, and is free from oscillation in said tedding position.

4,288,973
MACHINE FOR PRODUCING CHENILLE YARN

Fedora Tani, Florence, Italy, assignor to Chenil Cont GS S.R.L.

Filed Aug. 10, 1979, Ser. No. 65,711
Int. Cl.[3] D02G 3/42
U.S. Cl. 57—24 5 Claims

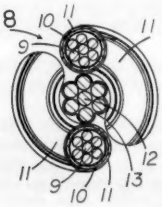


1. In a machine for producing chenille yarn, at least one yarn-forming assembly including means for feeding at least one pair of binding yarns and at least one effect yarn, a winding member, means for forming turns of the effect yarn on the winding member, cutter means, and means for moving the cutter means towards and away from said winding member into and out of engagement with the effect yarn at selected intervals as said yarns are fed to said winding member in order to cut the turns of effect yarn when the cutter is moved towards the winding member and to leave them intact when it is moved away from the winding member to provide respectively for the formation of yarn having alternating chenille and boucle portions.

4,288,974
DULLED CONDUCTOR AND MAKING SAME

Thomas Eistrat, 1020 S. Almansor St., Alhambra, Calif. 91801

Continuation-in-part of Ser. No. 869,850, Jan. 16, 1978, Pat. No. 4,149,367, and Ser. No. 12,168, Feb. 14, 1979, Pat. No. 4,198,807. This application Dec. 5, 1979, Ser. No. 100,787
The portion of the term of this patent subsequent to Apr. 17, 1996, has been disclaimed.
Int. Cl.[3] D07B 7/14
U.S. Cl. 57—223 20 Claims

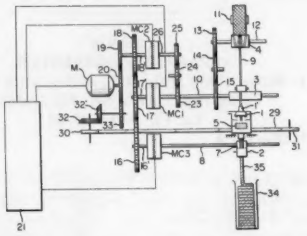


1. A covered plurality of insulated conductors, which comprise:
(a) a cover;
(b) a plurality of insulated conductors within the cover;
(c) a non-specular or dulled exterior on the surface of the cover.

4,288,975
METHOD AND APPARATUS FOR STARTING A SPINNING MACHINE

Yoshiaki Yoshida; Osamu Suzuki, both of Ohbu; Keiji Onoue, and Kazuo Seiki, both of Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 17, 1980, Ser. No. 131,132
Claims priority, application Japan, Mar. 22, 1979, 54/32315
Int. Cl.[3] D01H 15/02, 1/30
U.S. Cl. 57—263 5 Claims

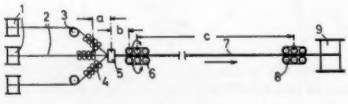


1. A method for starting-up an open-end spinning machine for yarn ending, comprising:
(a) increasing the speed of the spinning rotor from a stopped position to a predetermined speed approaching its operating speed;
(b) momentarily decreasing the speed of the spinning rotor to that of a substantially lower speed in order to effect the yarn ending;
(c) increasing the speed of the spinning rotor to its normal operating speed while the yarn-feed direction is reversed for yarn ending; and
(d) again reversing the yarn-feed direction to return it to its normal operating direction thereby initiating the feed of the sliver.

4,288,976
APPARATUS FOR THE SZ-TWISTING OF POWER CABLE CONDUCTORS WITH SECTOR-SHAPED CONDUCTOR CROSS SECTION

Dieter Vogelsberg, Coburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 20, 1979, Ser. No. 59,195
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1978, 2833703
Int. Cl.[3] H01B 13/04
U.S. Cl. 57—293 6 Claims



1. In apparatus for the SZ twisting of power cable conductors with a sector-shaped conductor section, which includes:
stationary conductor supplies;
a twisting closer with a control guide for each conductor arranged ahead thereof;
a twisting device rotating with alternating direction of rotation, and
a pulling-off and take up device arranged after the twisting device,
the improvement comprising:
(a) the distance between the engagement point of each

control guide with a cable conductor and the first engagement point of the twisting device gripping the material to be twisted tensionally from the outside with the material to be twisted being small than, or at most equal to, the length of lay of the material to be twisted, given by the pull-off velocity and the speed of rotation of the twisting device, and being preferably smaller than, or at most equal to, one-half the length of lay; and

(b) the free distance between the twisting device and the nearest device gripping the material to be twisted in the circumferential direction from the outside in a torsion proof manner being very much larger than the length by which a longitudinal section of the twisted material is advanced during an interval of constant direction of rotation of the twisting device.

4,288,977

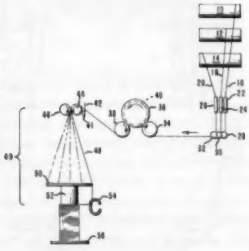
PROCESS FOR MAKING INTEGRATED RACKET STRINGS FROM MONOFILAMENTS

Thomas J. Csaky, Richmond; Sibbley P. Gauntt, Bon Air, and Ralph L. Heard, Jr., Richmond, all of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1980, Ser. No. 139,112

Int. Cl.³ D01H *13/30*; D02G *3/40*

U.S. Cl. 57—297 **4 Claims**



1. An improved process for making an integrated twisted string comprised of a middle flattened monofilament sandwiched between two outer flattened monofilaments, with each monofilament having a denier within the range of 3,000 to 8,000 and two opposite flattened sides throughout its length including the steps of aligning the monofilaments edge-to-edge and forwarding them into a twisting zone through a slot guide having a slot width which is greater than the thickness of the thickest of the monofilaments to allow free passage of all monofilaments but less than the total thickness of two adjacent monofilaments or the width of a monofilament so that said monofilaments cannot cross over one another in said slot or back twist through the slot as they are forwarded into the twisting zone, compensating for the greater lengths required for the two outer monofilaments in the resulting twisted string configuration by separately controlling the speeds and tensions of the monofilaments on their way to said zone, twisting the monofilaments together in the twisting zone, and bonding them to one another by means of a heat-activated adhesive resin to form an integrated twisted string, wherein the improvement comprises the sequential steps of: (1) applying to the surface of at least the monofilament which is to become the middle monofilament a continuous dry thin coating of a heat-activated adhesive resin; (2) aligning the three monofilaments edge-to-edge in a common plane slightly separated from one another and with one monofilament positioned between the other two monofilaments and forwarding under separately controlled speeds and tensions the thus aligned and separated monofilaments into a twisting zone through said slot formed between two axially parallel freely-rolling cylindrical surfaces; (3) compensating for the excess length in the two outer monofilaments by forwarding them at a positively controlled speed and allowing the speed of the middle monofilament to be freely controlled by being drawn into the twisting zone through said slot at a relative rate determined by the speed of the two outer monofilaments and by the twisting action in said zone while maintaining a tension on the middle monofilament which is no greater than the tension maintained on each of the two outer monofilaments as they enter said zone so that the speed of the middle monofilament entering said zone is always slightly less by the required amount than that of the two outer monofilaments; (4) twisting said monofilaments together into a string in said zone in a sandwiched configuration with each flattened side of the twisted coated middle monofilament maintaining continuous contact throughout its length in the string with a flattened side of the corresponding adjacent outer monofilament; and (5) heating the twisted string under controlled tension at a temperature which activates said adhesive resin and bonds the monofilaments together.

4,288,978

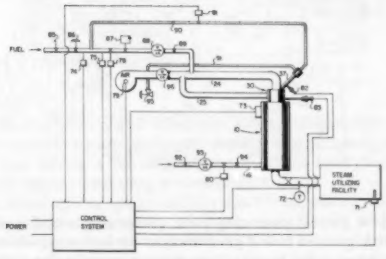
VAPOR GENERATOR

William G. Wyatt, Arlington, Tex., assignor to Vapor Energy, Inc., Grand Prairie, Tex.

Continuation-in-part of Ser. No. 907,694, May 19, 1978. This application May 8, 1979, Ser. No. 37,029

Int. Cl.³ F02C *7/26*

U.S. Cl. 60—39.05 **2 Claims**



1. A vapor generator comprising:

an enclosed combustion chamber;

means for delivering a mixture of fuel gas and combustion supporting gas to said combustion chamber;

means for delivering water to said combustion chamber for vaporization by heat derived from burning;

means for withdrawing combustion products and vaporized water from said combustion chamber;

a pilot burner positioned to deliver a pilot flame into said combustion chamber;

means for delivering a combustion supporting gas to said pilot burner;

means for delivering fuel gas to said pilot burner;

means for igniting the fuel gas in said pilot burner;

means for commencing delivery of combustion supporting gas and water to said combustion chamber at a first selected time;

means for commencing delivery of fuel gas to said pilot burner and for operating said igniting means at a second selected time later than said first selected time;

means for commencing delivery of fuel gas to said combustion chamber at a third selected time later than said second selected time;

means for detecting the presence of a flame in said combustion chamber;

means for disabling operation of said means for delivering fuel gas to said pilot burner and said pilot burner igniting means upon detection of a flame in said combustion chamber by said detecting means;

means for disabling operation of said means for delivering combustion supporting gas, fuel gas, pilot fuel gas, and said pilot fuel igniting means, at a fourth selected time later than said third selected time;

means for recommencing delivery of combustion supporting gas and water to said combustion chamber at a new first selected time following operation of said disabling means; and

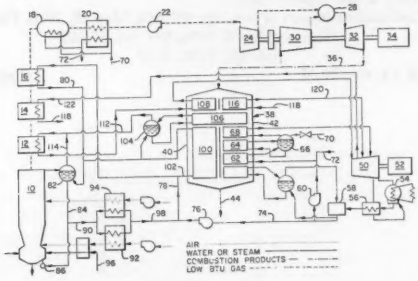
means for actuating each of said means for commencing delivery at a new selected second and third later times and for disabling operation of all of said means if no flame is detected in said combustion chamber after actuation thereof.

4,288,979

COMBINED CYCLE POWER PLANT INCORPORATING COAL GASIFICATION

Gregory N. Liljedahl, Tariffville, and Bruce K. Moffat, Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 21, 1979, Ser. No. 77,708
Int. Cl.³ F02C *3/28, 6/18*
U.S. Cl. 60—39.12 **3 Claims**



1. A power generating plant comprising a coal gasifier in which gaseous fuel is generated, an air heater which supplies heated air to the gasifier, a gas cleanup complex downstream of the gasifier, a booster fan downstream of the gas cleanup complex, a booster fan inlet heater upstream of the booster fan, a fuel gas compressor downstream of the booster fan, a gas turbine fired by said gaseous fuel, a heat recovery steam generator heated by the exhaust gases from the gas turbine, the heat recovery steam generator having two parallel gas passes through which the exhaust gases flow, one of the gas passes containing a high pressure steam generator, a steam turbine having high pressure, intermediate pressure, and low pressure steam stages, the high pressure steam generator supplying steam to the high pressure stage of the steam turbine, the other gas pass containing a high pressure reheater and a low pressure steam generator, the reheater supplying steam to the intermediate pressure stage of the steam turbine, and the low pressure steam generator supplying steam to the booster fan inlet heater, and also to the low pressure stage of the steam turbine.

4,288,980

COMBUSTOR FOR USE WITH GAS TURBINES

Hermann Ernst, Saint Cloud, Minn., assignor to Brown Boveri Turbomachinery, Inc., Saint Cloud, Minn.

Filed Jun. 20, 1979, Ser. No. 50,176
Int. Cl.³ F23R *3/06, 3/26, 3/36, 3/54*
U.S. Cl. 60—39.23 **13 Claims**

1. A reverse flow combustor for providing hot combustion gases comprising,

a. hollow outer casing means closed at one end to form a head cavity adjacent the closed end,

b. hollow annular inner casing means connected in the outer casing means in spaced relation thereto to define therewith an annular head cavity extension space, and a discharge outlet for said combustor,

c. said inner casing means also defining, a primary combustion zone, and a secondary combustion zone in communication with said primary combustion zone and said discharge outlet,

d. an inlet assembly mounted in said outer casing means for communication with said head cavity to receive combustion air therefrom,

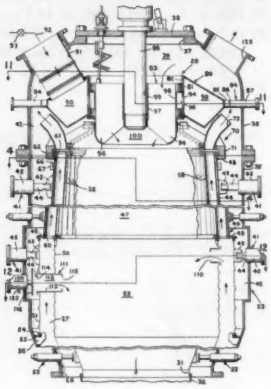
e. a liquid fuel inlet connected to said outer casing means,

f. a gaseous fuel inlet connected to said outer casing means,

g. means operative to control alternately, simultaneously and selectively the flow of liquid fuel and gaseous fuel to said combustor,

h. said inlet assembly connected to said liquid fuel inlet and gaseous fuel inlet and disposed to provide a mixture of at least one of said fuels and air to said primary combustion zone,

i. air inlet means for said combustor at the end of the outer casing remote from the head cavity including, air flow passage means to pass combustion air entering said combustor in a direction counter to the flow of combustion gases,



j. cooling means removably and replaceably connectible to the inner wall of said inner casing means and disposed about the primary combustion zone, including, a plurality of circumferentially disposed cooling tubes having one end connected to the air flow passage means to receive air entering the combustor and the opposite end having an outlet disposed to discharge the air to the head cavity in the outer casing,

k. adjustable metering means connected to the inner casing means to provide predetermined quantities of additional air for mixture and temperature control of combustion gases in the secondary combustion zone of the combustor, and,

l. said adjustable metering means includes, a fixed orifice bleed means for metering a predetermined quantity of air to said secondary combustion zone during all operating modes of the combustor.

4,288,981

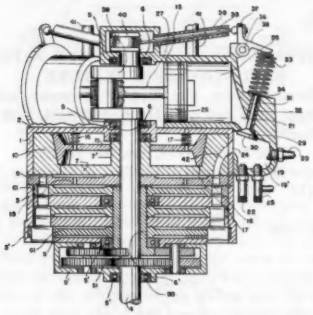
TURBINE-TYPE ENGINE

Elwood H. Wright, 7320 6th Ave., Tacoma, Wash. 98406

Filed Jun. 16, 1978, Ser. No. 916,096
Int. Cl.³ F02C *5/00*
U.S. Cl. 60—39.38 **1 Claim**

1. A turbine-type engine comprising, in combination, a casing, a rotor shaft revolubly mounted in a casing, a plurality of combustion chambers mounted about the casing, a control rotor fixed against relative rotation of the shaft and having a cylindrical flange fitted revolubly in the casing and formed with a series of laterally spaced circumferentially directed bands of impeller vanes and with passages through the flange

between the vanes; the first of the series of bands of impellers being extended only partially about the cylinder, a blade-type rotor mounted on a sleeve that is rotatably mounted about the said shaft, and located so that the passages through the control rotor extend to passages between vanes of the blade-type rotor, so that pressurized gases from the combustion chambers are directed to the vanes of the blade-type rotor so as to rotate said rotor, said combustion chambers mounted in the casing about the control rotor, means for independently admitting fuel charges and compressed air to the chambers, means in each chamber for igniting the charges, delivery passages from the chambers directed tangentially against the control rotor in the



plane of the partial band of impellers and passages; and water injecting means for injecting a fine spray of water in each of said combustion chambers independently of the injection of fuel charges in the corresponding combustion chamber so that water spray may be injected in each combustion chamber after detonation of the fuel therein, so as to generate in the combustion chamber, while cooling said chamber, usable steam pressure producing power incident to the dissipation of the internal heat of said engine against said impeller vanes and against the vanes of the blade-type rotor, in which

the blade-type rotor is fixed to the sleeve and the sleeve is rotatably linked by gears to the shaft.

4,288,982

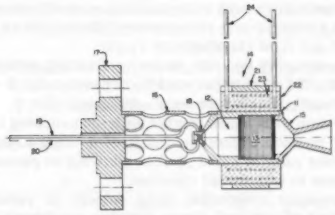
LOW THRUST MONOPROPELLANT ENGINE

Robert A. Frosh, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and John D. Kuenzly, Redondo Beach, Calif.

Continuation of Ser. No. 819,029, Jul. 25, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,474

Int. Cl.³ F02K *9/44*

U.S. Cl. 60—200 R **10 Claims**



1. A thruster for orienting spacecraft, comprising:

a thruster body;

a screen pack surrounded by and connected to said thruster body; and

means for injecting a propellant into said thruster body, including:

a plurality of injector tubes discrete from the thruster body; and

an injector shall having an infundibuliform cavity with a discharge aperture, receptive means for connecting said injector tubes to said shell and a plurality of opposed limitation means disposed to atomize and tangentially discharge a propellant directly into the cavity.

4,288,983

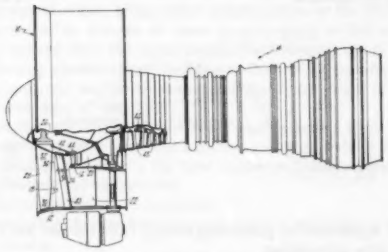
TURBOFAN ENGINE HAVING CORE SUPERCHARGING STAGE

Thomas E. O'Rourke, Jr., Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 19, 1978, Ser. No. 952,869

Int. Cl.³ F02K *3/06*

U.S. Cl. 60—226 R **7 Claims**



1. In a turbofan engine of the type having a bypass flow path and a core flow path which are separated by a core case and of the type having a fan stage upstream of the core case, the improvement comprising in combination:

an island splitter spaced radially apart from said core case at a locaton downstream of the fan stage placing said core flow path in communication with said bypass flow path immediately downstream of the island splitter; and

a supercharging stage mechanically coupled to the fan stage and extending outwardly into proximity with the core case such that the mechanically coupled supercharging stage is adapted to work only upon medium gases of the core flow path.

4,288,984

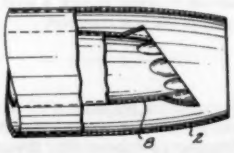
NOISE SUPPRESSING TURBOFAN NOZZLES AND METHOD

Waman V. Bhat, Redmond, and Charles P. Wright, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 19, 1978, Ser. No. 943,973

Int. Cl.³ F02K *1/46, 3/06*

U.S. Cl. 60—262 **17 Claims**



1. In a turbofan including a primary exhaust nozzle, core means for producing a primary exhaust flow through the primary exhaust nozzle, a fan nozzle encircling the primary exhaust nozzle such that the primary exhaust nozzle, at a location forward of its discharge end, is generally circular and concentric within the fan nozzle, and fan means for producing a fan flow through the fan nozzle, the velocity of the primary exhaust flow produced by the core means being greater than the

velocity of the fan flow produced by the fan means, the improvement comprising the fan nozzle and the primary exhaust nozzle being constructed and arranged relatively so that at the discharge end of the rearmost nozzle the upright thickness of the fan flow below the primary exhaust flow is greater than the lateral thickness of the fan flow at a location laterally of the primary exhaust flow for suppressing jet noise perceived below the turbofan.

4,288,985

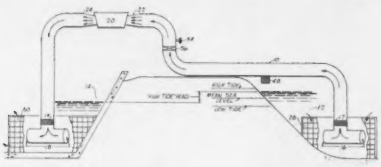
APPARATUS FOR GENERATING ENERGY FROM THE RISE AND FALL OF TIDES

Richard G. Dyck, 1120 Longfellow Dr., Beaumont, Tex. 77706

Filed Dec. 10, 1979, Ser. No. 102,142

Int. Cl.³ F16D *33/00*

U.S. Cl. 60—398 **2 Claims**



1. Apparatus for generating energy from the rise and fall of the tides comprising:

a first reservoir, the first reservoir being subject to tidal flow;

a second reservoir which is separated from the first reservoir and having a depth below the level of the lowest tide of the first reservoir and a height exceeding the highest tide of the first reservoir;

a duct, airtight and chargeable with water, connecting the first reservoir with the second reservoir;

tee-shaped channel elements at each end of the duct, with the vertical portion of the channel elements communicating with the duct and the two openings of the horizontal portion of the channel elements communicating with the first and second reservoirs;

filter elements situated in the duct in the vicinity of the openings of each tee-shaped channel element;

deflection screens surrounding the vicinity of the openings of each tee-shaped channel element;

a drop filter situated along the duct;

a charging and drain valve arranged in the duct;

a shutoff valve arranged in the duct; and

a turbine positioned within the duct and adapted to be operated by the flow of water passing between the first reservoir and second reservoir as tidal flow causes a change in the level of water in the first reservoir and the water in the second reservoir is urged to seek a level of equilibrium with the water in the first reservoir.

4,288,986

WAVE POWERED GENERATOR

James G. O. Watson, 11 Culross Rd., Bryanston, Sandton, Transvaal, South Africa

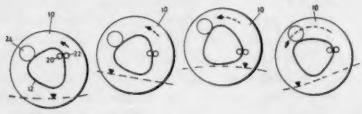
Filed Dec. 14, 1979, Ser. No. 103,717

Claims priority, application South Africa, Dec. 21, 1978, 78/7192

Int. Cl.³ E02B *9/08*

U.S. Cl. 60—501 **11 Claims**

1. A method of generating energy from waves in water consisting of supporting a buoyant body in water, causing the body alternately to rise and fall under the influence of waves in the water while constraining it to one side of its centre of gravity for rotary movement in one direction only and employing the rotary movement of the body to operate an energy converter.



4,288,987

PNEUMO-HYDRAULIC BOOSTER WITH RAPID-TRAVERSE FEATURE

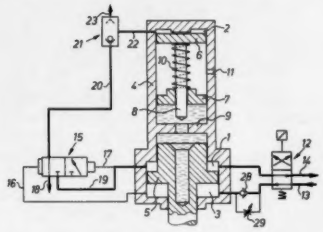
Artur Grüllmeier, Salem, Fed. Rep. of Germany, assignor to Eugen Rapp, Berg and Paul Haug, Aichwald, both of, Fed. Rep. of Germany

Filed Nov. 7, 1979, Ser. No. 92,450

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849113

Int. Cl.³ F15B *7/08*

U.S. Cl. 60—560 **4 Claims**



1. A pneumo-hydraulic booster having a rapid-traverse operation for driving a punching tool comprising

a housing having first, second and third chambers therein;

a first piston mounted to slide within said housing to repeatedly drive the punching tool by means of a power stroke and a return stroke;

said first and third chambers being selectively connectible to sources of pressure fluid and a venting atmosphere;

a second piston mounted to slide within said housing and positioned in tandem with said first piston, said second chamber being located on the side of said second piston remote from said first piston;

a booster valve having a first connection to said first chamber, a second connection to said third chamber, and a third connection to said second chamber, said booster valve being responsive to the pressure differential between said first and third chambers;

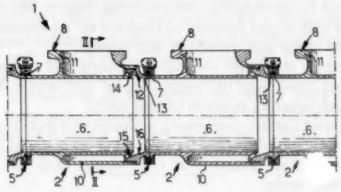
means actuating said first piston by directing pressure fluid into said first chamber, said first chamber thereby having a predetermined pressure to drive said first piston in a direction to establish contact with the punching tool; and said pressure differential being of a value to hold said booster valve in a first position allowing no pressure fluid to pass to said second chamber;

said pressure differential being subject to variation by contact of said first piston with the punching tool, said booster valve thereby being movable to a second position due to said variation of said pressure differential, said second position of said booster valve allowing pressure fluid to pass to said second chamber to drive said second piston in said driving direction to contact said first piston to provide an increased driving force on the punching tool.

4,288,988
METHOD AND APPARATUS FOR IMPROVING THE GAS FLOW IN AN INTERNAL COMBUSTION ENGINE EXHAUST MANIFOLD

Remi Curtil, Eaubonne, France, assignor to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint-Denis, France

Filed Jan. 18, 1978, Ser. No. 870,465
Claims priority, application France, Jan. 24, 1977, 77 01937
Int. Cl.³ F02B *37/00, 27/04;* F01N *7/10*
U.S. Cl. 60—605 **26 Claims**



8. Apparatus for reducing pressure oscillations in a stream of exhaust gases from an internal combustion engine, the engine having a plurality of cylinders arranged in each of at least one bank of cylinders, a piston in each cylinder, an exhaust port leading from each cylinder, an exhaust valve in each exhaust port, means for opening each exhaust valve during the expansion stroke of the corresponding piston and for closing the exhaust valve after the piston reaches bottom dead center, a single pipe exhaust manifold extending alongside the bank of cylinders, the manifold having an outlet end, a plurality of connecting pipes equal to the number of cylinders in said bank, each connecting pipe having an inlet end connected to the exhaust port of a corresponding cylinder and an outlet end connected to the manifold, said connections to the plurality of connecting pipes and to said supercharger turbine being the only openings for exhaust gas flow in said manifold pipe, and a supercharger turbine connected to the outlet end of the manifold, wherein the improvement comprises:

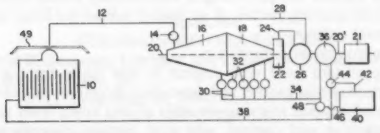
the outlet end of each connecting pipe being located closely adjacent to its inlet end, and the ratio of the cross-sectional flow area at the outlet end of each connecting pipe to the flow area at the inlet end being in the range from about 0.3 to about 0.8, such that the potential energy of the exhaust gas in the connecting pipe is maintained at a high level during the period from opening of the exhaust valve until the piston reaches bottom dead center, and

the manifold pipe having a substantially uniform flow area the diameter of which is less than the diameter of each cylinder bore by a ratio in the range from about 0.30 to about 0.75, such that a high velocity is maintained by the exhaust gases flowing in said manifold piper.

4,288,989
METHOD AND APPARATUS FOR OBTAINING MECHANICAL ENERGY FROM LOW TEMPERATURE HEAT SOURCES

James L. Cassidy, 66 Prospect St., Turners Falls, Mass. 01376

Continuation-in-part of Ser. No. 9,163, Feb. 5, 1979, Pat. No. 4,235,080. This application Mar. 19, 1979, Ser. No. 21,561
Int. Cl.³ F01K *9/00*
U.S. Cl. 60—685 **5 Claims**



1. A process for obtaining mechanical energy from heat sources having, in general, temperatures lower than those provided by burning fuel or fissioning fresh nuclear material, comprising:

a. generating vapor pressure from a suitable fluid having a desired low boiling point in a heat-exchanger vapor pressure generator placed in juxtaposition with a suitable low temperature heat source;

b. leading the pressurized vapor through a turbine for expansion for obtaining useful work;

c. leading the spent vapor from the turbine into an expansible chamber-type abentropic engine having working and non-working ends, the engine being of modified turbine type with blades designed to handle low pressure wet vapor as it condenses, the engine being mounted on the same shaft as the turbine which feeds it and being jacketed and insulated to preserve a constant temperature;

d. maintaining a vacuum on the non working end of the engine against which the spent exhaust vapor is forced to do useful work by virtue of its higher residual vapor pressure which brings about condensation at the boiling point of an amount of vapor proportionate to the work done and since the vapor pressure and temperature of the boiling condensate are the same as those of the condensing vapor, the engine operates continuously by virtue of the latent heat of the vapor;

e. leading the resultant condensate near its boiling point to a vapor pressure generator injection pump via valved ductwork for return to the heat exchanger vapor pressure generator to be recycled;

f. repeating the above sequence;

g. utilizing the mechanical work done as expedience may require;

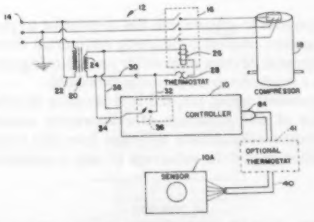
h. removing the minor portion of uncondensed vapor with a vacuum pump for the purpose of producing a vacuum in the non-working end of the expansible chamber type abentropic engine; and

i. leading the removed vapor from the vacuum pump to a suitable section of the turbine for recycling therein.

4,288,990
CONTROLLER FOR AN AIR CONDITIONING OR HEATING SYSTEM

Daniel R. Schulz, 1009 Hollywood Ave., Clearwater, Fla. 33519

Continuation of Ser. No. 30,369, Apr. 16, 1979, abandoned. This application Mar. 12, 1980, Ser. No. 129,690
Int. Cl.³ H02J *1/00;* F25B *49/00*
U.S. Cl. 62—158 **15 Claims**



1. An apparatus for activating a thermostat for an air conditioning or heating system, the thermostat controlling power from a power source to the air conditioning or heating system, comprising in combination:

a timing circuit providing a first output during a first timing period and a second output during a second timing period;

a controllable switch means connected to activate or deactivate the thermostat controlling of the air conditioning or heating system;

means for connecting said first output to said controllable switch means for deactivating the thermostat during said first timing period;

means for connecting said second output to said controllable switch means for activating said thermostat during said second timing period thereby enabling the thermostat to power the air conditioning or heating system;

thermostat line sensor means for sensing the condition of said controllable switch means and the thermostat to reset said timing circuit to said first timing period upon termination of power to the air conditioning or heating system;

power source sensor means for sensing the level of available power from the power source to reset said timing circuit to said first timing period upon a reduction in the level of the power source below a preselected minimum power level.

4,288,991

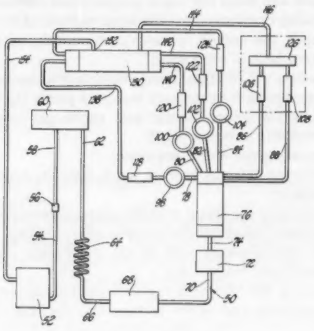
REFRIGERATION AND HEATING IMPROVEMENT

Harold R. Weeks, 1212 North St., Bowling Green, Ohio 43402

Filed Mar. 30, 1976, Ser. No. 671,746

Int. Cl.[3] **F25B** *39/04;* **F25D** *23/12*

U.S. Cl. 62—183 **9 Claims**



1. In a refrigeration device for food and beverages, the improvements comprising:

a compressor;

a primary condenser;

a secondary condenser;

a plurality of evaporators;

a fan operable to transmit heat away from said secondary condenser; means operable to conduct heat from said primary condenser to a heating device for food and beverages;

means operable to actuate said fan responsive to pressure in a refrigerant conduit conducting refrigerant from one of the aforesaid devices responsive to said refrigerant being above a predetermined pressure threshold;

said evaporators being arrayed in a plurality of subarrays;

a first one of said subarrays of evaporators maintaining a temperature substantially different from the temperature in another one of the subarrays of said evaporators.

4,288,992

CURTAIN FOR OPEN FRONT FREEZER OR REFRIGERATOR

Carlyle R. Eliason, 905 W. Inkster, Kalamazoo, Mich. 49008, assignor to Eliason Corporation, Kalamazoo, Mich.

Filed Feb. 19, 1980, Ser. No. 122,647

Int. Cl.[3] **A47F** *3/04;* **F25D** *23/02*

U.S. Cl. 62—256 **17 Claims**

1. In a display-type, refrigerated food cabinet having an access opening communicating with the atmosphere, curtain structure for substantially covering said access opening, comprising:

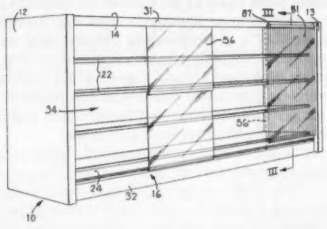
a first curtain comprising a flexible sheet having first and second spaced and substantially parallel edges, said sheet being prestressed to roll up on itself around an axis substantially parallel with said first edge, said sheet being self-supporting in a tightly rolled position when suspended from said first edge thereof;

means for attaching said first edge of said sheet to said cabinet along and substantially parallel to one edge of said access opening, said sheet in its rolled position being confined near said one edge of said access opening to permit free access to the inside of said cabinet through said access opening, the distance between said first and second edges of said sheet when unrolled being sufficient for covering said access opening from said one edge to the other edge of said access opening to obstruct air movement between the inside and outside of said cabinet;

engaging means for releasably locating said second edge of said sheet near the other edge of said access opening in said covering position of said sheet;

a second curtain comprising a plurality of side-by-side elongate strips of flexible transparent sheet material, said strips being fixed together at their upper ends but not their lower ends;

means for attaching the upper ends of said strips to said cabinet and extending along and substantially parallel to the upper edge of said access opening with said strips depending across said access opening, the depending portions of said strips being laterally displaceable one from another for permitting physical access to the inside of said cabinet, said strips when undisturbed covering said access opening from the top substantially to the bottom thereof to obstruct air movement between the inside and



outside of the cabinet while permitting visual inspection therethrough of the inside of the cabinet, said first and second curtains in their closed positions being spaced one in front of the other across said access opening with an air layer therebetween to act as a thermal barrier across said access opening.

15. In a refrigerator of the kind having an openfront cabinet, said cabinet having upper and lower front wall portions extending the width of the cabinet and respectively bounding the top and bottom of an access opening into the cabinet, said upper and lower front wall portions substantially sharing a common plane;

air curtain means for providing a refrigerated stream of air crossing said access opening in spaced relation behind said common plane, said air curtain means including an air outlet slot in said cabinet behind said upper front wall portion and an air return slot in said cabinet behind said lower front wall portion, said slots extending the width of said cabinet for providing a substantially planar downwardly moving curtain of air spaced behind the front wall of said cabinet;

the improvement comprising:

a strip curtain fixed with respect to said upper front wall portion of said cabinet and depending therefrom into close spaced relation to the upper edge of said lower front wall portion of said cabinet, said strip curtain comprising a plurality of side-by-side elongated strips of flexible transparent sheet material, said strips being fixed together at the upper ends thereof but not at the lower ends thereof;

means for attaching the upper ends of said strips to said cabinet and extending substantially parallel to the upper edge of the access opening of said cabinet, with said strips depending across said access opening, the depending portions of the strips being laterally displaceable one from another for permitting physical access to the inside of said cabinet, said strips when undisturbed covering said access opening from the top thereof substantially to the bottom thereof to obstruct air movement between the inside and outside of the cabinet while permitting visual inspection therethrough of the inside of the cabinet, said strip curtain being spaced forwardly from said air curtain means, the lower ends of said strips being spaced above the upper edge of said lower front wall portion by a vertically narrow space extending widthwise of said access opening, the lower ends of said strips lying adjacent the front edge of said air return slot of said air curtain means, the space being provided so as to prevent the lower ends of the strips from being displaced or sucked into the air return grill and to permit a modest flow of air through the gap between the strip ends and cabinet edge wall.

4,288,993

REFRIGERATOR

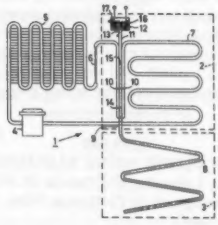
Adrianus J. van Mensvoort, and George A. A. Asselman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 77,956

Claims priority, application Netherlands, Oct. 5, 1978, 7810047

Int. Cl.³ F25D *11/02*

U.S. Cl. 62—333 **2 Claims**



1. A refrigerator comprising a freezing compartment; a refrigerating compartment; a primary refrigerating system containing a primary refrigerant and including a primary evaporator disposed in the freezing compartment; a secondary refrigerating system containing a secondary refrigerant and a control gas and including a secondary evaporator disposed in the refrigerating compartment and a secondary condensor disposed in the freezing compartment in heat-exchange contact with the primary evaporator, said secondary refrigerating system being constituted as a tube closed off at the outer end of the secondary evaporator portion thereof; a reservoir containing a reversible control gas getter and having a supply duct connected to the outer end of the secondary condensor portion of the secondary refrigerating system tube; and a breakable seal arranged in the supply duct of the reservoir to enable the reservoir to be connected to said secondary condensor portion without contamination of the control gas getter.

4,288,994

GOLFBALL CENTER FREEZER

David B. Burgener, Lombard, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Filed Aug. 18, 1980, Ser. No. 179,379

Int. Cl.³ F25D *25/02*

U.S. Cl. 62—381 **15 Claims**

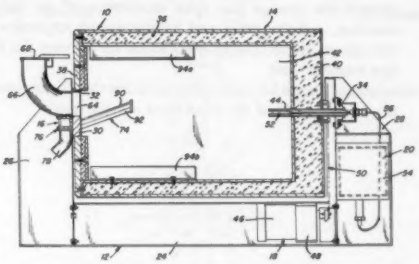
1. A freezer for cooling normally resilient spherical objects to a substantially rigid state and for selectively delivering the objects in the rigid state to a work station at ambient temperature, said freezer including:

a hollow rotatable drum adapted to receive and continuously tumble a batch of said spherical objects in random order;

drive means for rotating said drum at a preselected speed;

cooling means for maintaining the interior of said drum at a predetermined subfreezing temperature calculated to provide the desired degree of rigidity to the objects within a preselected cool-down time;

a dispenser at one end of said drum, said dispenser comprising rack means within the drum for successively arranging a number of objects from the random batch into an ordered series, and an object metering mechanism for selectively dispensing singular objects from said series through a proximal endwall of the drum;



a conveyor communicating with said metering means for transporting said dispensed objects from said dispenser to said work station, whereby after said preselected cool-down time, objects in a uniform substantially rigid state may be presented one-at-a-time to the work station at a rate independent of the residence time for the objects in the freezer.

4,288,995

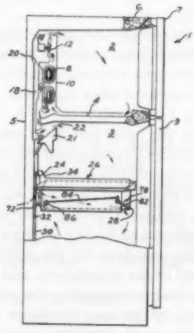
HOUSEHOLD REFRIGERATOR MOVABLE STORAGE ASSEMBLY

Bernard J. Grimm, and Richard A. Dossett, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Nov. 26, 1979, Ser. No. 97,477

Int. Cl.³ F25D *25/02*

U.S. Cl. 62—382 **8 Claims**



1. In a refrigerator having a fresh food compartment having side and rear walls, an air duct having an air outlet opening in the fresh food compartment for delivering refrigerated air to the fresh food compartment, a movable storage assembly hav-

ing air flow control means in the fresh food compartment comprising:

a removable storage pan;

a shroud for the pan having a bottom wall and two side walls and open at the front and rear, said shroud cooperating with the pan to provide an air flow path therebetween;

a cover for the pan secured to the shroud;

an air director pivotally attached to the rear of the shroud;

control means including a movable control mechanism assembly, a linkage member having at one end cooperating with the air director to move the air director to open and closed positions to regulate the amount of cold air flowing around the storage pan upon movement of the linkage member, and the other end having means responsive to movement of the control mechanism for moving the linkage member; and

attachment means for removably securing the storage assembly to the inside of the fresh food compartment.

4,288,996

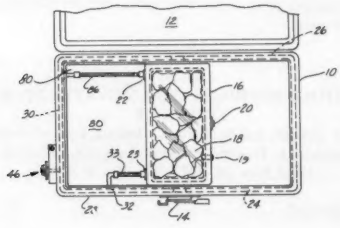
PORTABLE SUBLIMATION REFRIGERATOR-FREEZER

Walter Roncaglione, 2881 NE. 35th Ct., Fort Lauderdale, Fla. 33308

Continuation-in-part of Ser. No. 946,496, Oct. 18, 1978, Pat. No. 4,195,491. This application Nov. 28, 1979, Ser. No. 97,999

Int. Cl.³ F25D *3/12*

U.S. Cl. 62—384 **12 Claims**



1. A sublimation refrigerator, comprising: an insulated outer container including a cover movable between an open position and a closed position; an inner container for a sublimating solid adapted to be disposed within the outer container, the inner container having a removable cover; a freezer compartment supported within the outer container and having a movable cover; a first elongated cooling coil extending along the interior side walls of the outer container and having one of its ends connected to the interior of the container for the sublimating solid; a second elongated cooling coil disposed within said freezer compartment and having its input ends connected to the interior of the container for the sublimating solid and its output end vented to the atmosphere; and manually adjustable restricting valve means connecting the output end of the first coil to the exterior of the outer container whereby a sublimating solid may be disposed within the inner container, the valve adjusted so as to control the relative flow of gas generated by sublimation of the solid through said first and second coils, and the temperature within the freezer compartment may be maintained at a lower value than the temperature within the outer container exteriorly of the freezer compartment.

4,288,997

COOLING SYSTEM FOR SHIPPING CASKS

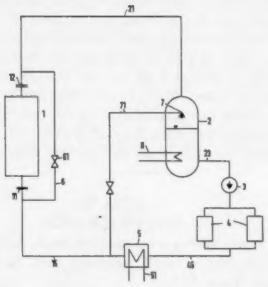
Eckart Friesen, Dreieich; Hans P. Thogersen, and Roland Kühnel, both of Dietzenbach, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim (Ruhr), Fed. Rep. of Germany

Filed Apr. 3, 1979, Ser. No. 26,524

Claims priority, application Fed. Rep. of Germany, May 4, 1978, 2814796

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—434 **4 Claims**



1. Cooling system having a container for transporting heat-emitting parts without temperature shock after removal from nuclear installations, comprising a closed loop for carrying water and steam or water alone, and means for connecting the container to said loop, said loop having disposed therein a heatable mixing condenser for regulating pressure and temperature in said loop, a filter installation for removing possible radioactive contamination from the water, a cooler for cooling water in said loop, a pump, and valve-control means for controlling pressure and temperature in said loop.

4,288,998

POLYLOBE DRIVE ELEMENT

Andrew C. Schnur, Lafayette, and Donald M. Wilhelm, Novato, both of Calif., assignors to California Pellet Mill Company, San Francisco, Calif.

Continuation of Ser. No. 912,226, Jun. 5, 1978, abandoned. This application Apr. 12, 1979, Ser. No. 29,291

Int. Cl.³ F16D *3/18*

U.S. Cl. 64—9 R **7 Claims**

1. A shaft drive element comprising:

a male coupling member having a cross section defined by segments of a logarithmic spiral joined end to end;

a female coupling member having a cross section defined by segments of the same spiral of greater radius joined end to end; and

one half of said segments are of a clockwise spiral, and one half of said segments are of a counterclockwise spiral for both the male and female coupling member.

4,288,999

APPARATUS TO LESSEN THE ENTANGLEMENT OF TUBULAR FABRICS

Larry D. Sterling, and Wilbert Melvin, Jr., both of Dover, Del., assignors to International Playtex, Inc., Stamford, Conn.

Filed Feb. 5, 1979, Ser. No. 8,986

Int. Cl.³ D06B *23/00*; B65B *11/58, 67/08*

U.S. Cl. 68—13 R **8 Claims**

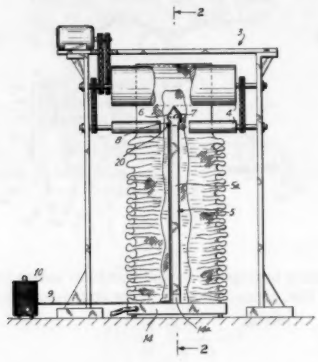
1. An apparatus for preparing a tubular extent of fabric for processing comprising:

hoop inserter means for positioning a length of hooping material along an axis; and

means for continuously delivering a tubular extent of fabric axially along the axis of said hoop inserter means to form

a collapsed donut-shaped tubular extent of fabric about said length of hooping material;

said hoop inserter means and hooping material having a length sufficient for the ends of said hooping material to extend from both ends of said collapsed tubular extent of



fabric so that said ends of said hooping material can be joined to form an endless hoop about said collapsed donut-shaped tubular extent of fabric for lessening the entanglement of said tubular extent of fabric during subsequent fabric treatment processing.

4,289,000

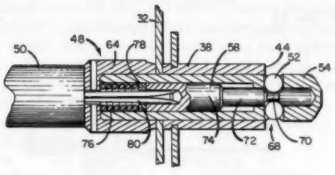
PICK-RESISTANT TUBULAR LOCK AND KEY FOR OPERATING THE SAME

Anker J. Nielsen, Jr., Holden, Mass., assignor to Omco, Inc., Holden, Mass.

Filed Aug. 13, 1979, Ser. No. 66,479

Int. Cl.³ E05B *67/36*

U.S. Cl. 70—34 **8 Claims**



1. In a conventional tubular lock having an elongated tubular lock housing which has an axial key hole in its rear wall, two diametrically opposed ball wells formed transversely through the lock housing, the ball wells opening at the inner and the outer cylindrical surfaces of the hollow lock housing, a locking ball sliding in each ball well and being prevented from outward escape therefrom, a cylindrical plunger having a concave cupped rear face, the plunger sliding within the elongated lock housing and slidably engaging the undersides of the locking balls, the plunger being exteriorly shaped to urge the balls outwardly as the plunger slides forwardly to its locking position, and to release the balls so that they drop inwardly as the plunger slides rearwardly to its unlocking position, and a compression spring positioned in the lock housing between the rear wall of the lock housing and the rear face of the plunger, the spring normally biasing the plunger to its locking position, the improvement therein comprising: a washer having a periphery shaped and sized to telescopically fit coaxially within the hollow lock housing and positioned between the rear wall of the lock housing and the rear face of the plunger, said washer having a non-circular central opening through which a conventional expanding key having a circular profile cannot be inserted.

4,289,001

KEY-OPERATED DEVICE FOR ACCESS CONTROL SYSTEM

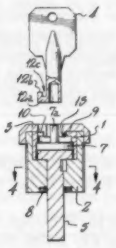
John C. Corfield, Lacey Green, England, assignor to Unimax Switch Limited, Maidenhead, England

Filed Jan. 15, 1980, Ser. No. 112,329

Claims priority, application United Kingdom, Jan. 26, 1979, 2813/79

Int. Cl.³ E05B *15/06*

U.S. Cl. 70—346 **7 Claims**



1. A key-operated device comprising a fixed hollow body having a plate-like wall, said wall having therein a key-hole for the admission of an end of a key inserted on an axis traversing said wall and passing through said key-hole, an actuating member mounted within said body to be rotatable about said axis, said member having therein a recess open towards said key-hole and having at that end thereof which is adjacent said plate-like wall an annular flange directed inwardly towards said axis, said flange having an innermost edge and having at least one notch formation capable of being engaged to transmit torque to said flange to rotate said member, a basically cylindrical wall provided on said body around said key-hole and extending axially inwardly from said plate-like wall to overlie said innermost edge of said flange on said member, a key comprising a stem lying on an axis and at least one lug projecting laterally from said stem and including a portion extending parallel to but offset from the axis of said stem, said stem being adapted to enter said key-hole, and said plate-like wall and axially extending wall being shaped to provide clearance for said lug, whereby on insertion of said key into said key-hole said axially extending portion of said lug can be caused to enter said body and said recess in said member and to engage said notch in said flange in a position radially outwards of said axially extending wall to transmit torque to said flange in order to rotate said member about said axis.

4,289,002

KEY FOR A CYLINDER LOCK AND METHOD FOR MAKING SAME

Heinrich Gretler, Hinwil, Switzerland, assignor to Bauer Kaba AG Sicherheits-Schliessyteme, Switzerland

Continuation of Ser. No. 720,784, Sep. 7, 1976, abandoned. This application Mar. 2, 1978, Ser. No. 882,882

Claims priority, application Switzerland, Sep. 11, 1975, 11820/75

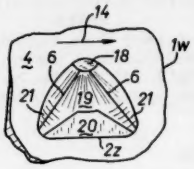
Int. Cl.³ E05B *27/06*

U.S. Cl. 70—358 **10 Claims**

1. In a key for a cylinder lock, the key comprising an elongated blade having a blade surface with a plurality of recesses therein to receive tumbler pins of the lock, the lock having a plurality of tumbler pins forming a permutation inclined relative to said blade surface, the improvement wherein at least one recess of said plurality of recesses includes

a planar base portion spaced inwardly from said blade surface,

a planar side wall portion spaced from said base portion and lying adjacent to said blade surface and inclined relative



thereto, said planar side wall portion having substantially the shape of an isosceles triangle and lying in a plane parallel to the longitudinal dimension of said blade; and

a conical side wall surface portion extending between said base portion and said planar side wall portion.

4,289,003

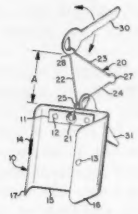
KEY HOLDER

Tayhugh L. Yang, 401 Robert E. Lee Blvd., New Orleans, La. 70124

Filed May 10, 1979, Ser. No. 37,659

Int. Cl.³ A47G *29/10*

U.S. Cl. 70—456 B **18 Claims**



1. A key holder for holding a plurality of keys, having holes in them at their bases, comprising:

a backing;

a triangularly shaped, rigid, at least generally flat, loop keyholder means forming a flat, triangularly shape having a base and two interconnecting legs for holding the keys when looped through the holes in them; and

attachment means connected to the apex corner of said triangular shaped loop means for attaching said loop means at said legs to said backing, but allowing it to pivot about said backing at said apex corner.

4,289,004

COIL SPRING MANUFACTURING MACHINE

Reijiro Itaya, Tokyo, Japan, assignor to Kabushiki Kaisha Itaya Seisaku Sho, Tokyo, Japan

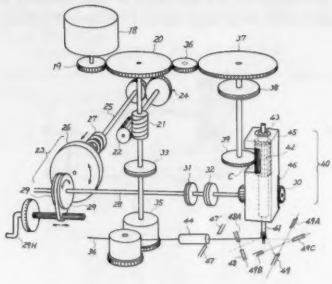
Filed May 29, 1979, Ser. No. 42,960

Claims priority, application Japan, Feb. 19, 1979, 54-18109

Int. Cl.³ B21F *3/04*

U.S. Cl. 72—7 **4 Claims**

1. A computer controlled apparatus for producing coil springs comprising computer means, wire supply means, a single driving motor, a drivable winding mandrel movable axially for pitch setting, an axially elongated gear for axially supporting said mandrel, a first gear unit including a first gear, second and third gear units with each of said gear units being provided a magnetic clutch, said driving motor being operationally coupled with said axially elongated gear for rotatably supporting said mandrel through said first gear unit, and an axial gear for axially moving said mandrel through said second gear unit, said wire supply means being operative to supply wire through said third gear unit and said magnetic clutches



are operative in response to said computer means for controlling said first, second and third gear units respectively.

4,289,005

PROCESS AND DEVICE FOR CONTROLLING THE FLATNESS OF A COLD-ROLLED METAL SHEET

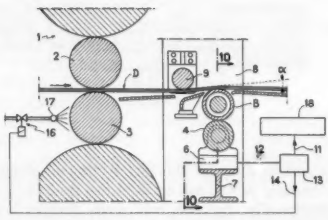
Pierre M. Cabaret, Paris; Maurice B. Daboust, Mont Louis sur Loire, and Pierre R. Engerran, Creil, all of France, assignors to Union Siderurgique du Nord et de l'est de la France (USINOR), Paris, France

Filed Apr. 10, 1979, Ser. No. 28,917

Claims priority, application France, Apr. 13, 1978, 78 10906

Int. Cl.³ B21B *37/04*

U.S. Cl. 72—12 **23 Claims**



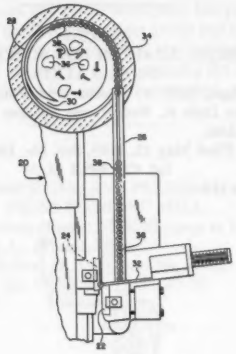
1. A process for controlling the flatness of a moving metal sheet subjected to a cold-rolling operation, comprising measuring tensions in different regions of the width of the sheet by means of coaxial substantially adjoining rollers which engage the sheet and extend transversely of the direction of movement of the sheet, said regions being at least three in number with a corresponding number of said rollers, calculating the sum of the tensions measured in the respective regions by said rollers, calculating from the result obtained the theoretical tension in each region by taking into account an axial extent to which the sheet engages each roller so that said theoretical tension corresponds to a tension uniformly distributed along the width of the sheet, comparing said theoretical tension with the tension effectively measured in each region and exerting, if required, correcting actions on the sheet as a function of the results of said comparison.

4,289,006

APPARATUS FOR PRODUCING THREADED SELF-TAPPING STAINLESS STEEL SCREWS

Charles R. Hallengren, Deerfield, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 8, 1979, Ser. No. 1,976
Int. Cl.³ B21H *3/06*; B21K *1/56*
U.S. Cl. 72—38 **5 Claims**



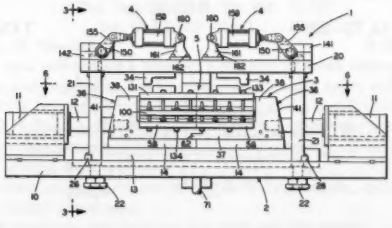
1. In an apparatus for producing self-tapping threaded fasteners from 300 series nickel-chromium stainless steel material, including a pair of opposing thread-rolling die members adapted to move relative to one another with a fastener blank positioned between opposing thread-forming faces thereof, rail means adapted to feed a plurality of headed fastener blanks in succession between said pair of opposing thread-rolling die members, said rail means including two parallel portions spaced by a distance greater than the shank diameter but less than the minimum head dimension to support the blanks by means of their heads with the shanks positioned between said two portions, an insulating tunnel means surrounding at least a predetermined extent of said rail means, means for supplying fluid refrigerant to the fastener blanks as they pass through said insulating tunnel means to chill said blanks to a temperature substantially below 0° F. so that said blanks are in a chilled condition as they are deformed in the thread-rolling die members to produce self-tapping threaded fasteners having a thread hardness in the range of RC 45–50 while maintaining a core hardness in the area of RC 30.

4,289,007

APPARATUS FOR HYDRAULICALLY FORMING SHEET METAL PULLEYS

Derald H. Kraft, Canton, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Filed Dec. 5, 1979, Ser. No. 100,649
Int. Cl.³ B21D *26/04*
U.S. Cl. 72—58 **17 Claims**



1. Apparatus for hydraulically forming a grooved pulley from a cup-shaped sheet metal blank having a bottom hub wall and a side wall, said apparatus including:

(a) base means;

(b) a pair of die holding members mounted on the base means for reciprocal movement toward and away from each other on said base means;

(c) internal die means adapted to support a sheet metal blank between the die holding members;

(d) groove-forming die means mounted on each of the die holding members for capturing a blank supported by the internal die means and for forming at least a single groove in the side wall of the blank;

(e) pin means operatively engageable with the die holding members for clamping the die holding members and groove-forming die means in a closed position in the horizontal direction;

(f) a plurality of post means mounted on the base means and extending vertically upwardly therefrom;

(g) means for supplying fluid to the interior of a captured blank when the die holding members and die means are in closed position;

(h) ram means mounted on the post means for reciprocal vertical axial movement therealong;

(i) hub wall engaging die means mounted on the ram means and engageable with the bottom hub wall of a blank for axially compressing a captured blank in cooperation with hydraulic bulging of the side wall outwardly toward the groove-forming die means when the ram means moves downwardly toward a die vertical closed position;

(j) locking means operatively engageable with the post means and ram means for locking the hub wall engaging die means in a vertically closed die position when the ram means is at the end of its axial compression stroke; and

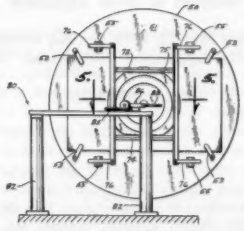
(k) means for increasing the pressure of the hydraulic fluid trapped in the compressed blank to final form the pulley groove.

4,289,008

APPARATUS FOR FORMING A UNIVERSAL CHASE TOP

Thomas L. Steele, Jesup, Iowa, assignor to John S. Schmitz and Roger W. Theobald, both of Omaha, Nebr.

Filed Jan. 28, 1980, Ser. No. 116,137
Int. Cl.³ B21D *22/14*
U.S. Cl. 72—83 **1 Claim**



1. An apparatus used in the fabrication of a chase top for a fireplace exhaust pipe comprising:

a flat circular metal disc containing an outer ring of apertures and an inner ring of apertures, said disc being normal to and centered on a central axis;

a circular wooden chuck containing a centrally disposed circular opening and a ring of apertures therein which coincide with said outer ring of apertures on said metal disc, said chuck being normal to and centered on said central axis;

a plurality of securing means for fastening said chuck to said metal disc wherein said securing means being disposed through said outer ring of apertures on said metal disc and through said ring of apertures on said chuck;

a circular tooling element having an outside diameter corresponding to the diameter of said circular opening in said chuck and containing a tapered circular opening and a plurality of apertures which coincide with said inner ring of apertures on said metal disc, said tooling element being normal to and centered on said central axis;

a plurality of fastening means for fastening said tooling element to said metal disc wherein said fastening means are disposed through said inner ring apertures in said metal disc and into said plurality of apertures on said tooling element;

a plurality of clamps pivotally attached to said chuck and a plurality of mounting brackets rigidly attached to said chuck;

a reinforcing plate means for releasably securing an apertured flat sheet of metal to said chuck for cooperation with said plurality of mounting brackets, said reinforcing plate means being normal to and centered on said central axis;

means for rotating said metal disc about said central axis thereby rotating said chuck, said tooling element, said flat sheet of metal and said reinforcing plate means;

a base member containing a plurality of apertures;

a pivot arm;

a pivot rod rigidly connected to said pivot arm and projecting downwardly from said pivot arm, said pivot rod extending through one of the apertures on said base member;

a second pivot arm containing a plurality of apertures;

a second pivot rod rigidly connected to said first pivot arm and projecting upwardly from said first pivot arm, said second pivot rod extending through one of the apertures on said second pivot arm; and

a movable deforming element rotatably disposed on said second pivot arm, said deforming element being a cylinder having a height less than the diameter and having both circumferential edges rounded, said deforming element being positioned adjacent to said circular opening in said tooling element and adapted to deform said flat sheet of metal whereby said flat sheet of metal is bent to conform to said tapered opening in said tooling element as said flat sheet of metal is rotated about said central axis.

4,289,009

PROCESS AND DEVICE FOR THE MANUFACTURE OF BLISTERS WITH HIGH BARRIER PROPERTIES

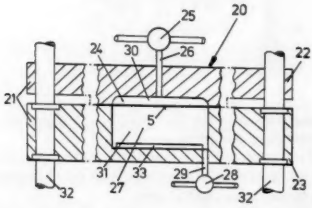
Werner Festag, and Hans-Ueli Müller, both of Schaffhausen, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 21, 1979, Ser. No. 40,980

Claims priority, application Switzerland, Jun. 2, 1978, 6065/78

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—60 **16 Claims**



1. Device for manufacturing blisters from metal-plastic composite foil which comprises a clamping facility including two separable parts between which a metal-plastic composite foil is firmly clamped, one part of which is a pressure resistant plate and the other part of which is a die having a base and a recess therein corresponding to the desired blister shape, wherein said pressure resistant plate includes at least one pressure supply line for supplying a fluid medium thereto for deforming said foil into said recess, said line connected to a closed chamber formed with the help of the foil held fast in the clamping facility, and said die being provided with a lubricating layer in the base thereof so that said foil is smoothly elongated or stretched into said recess and over said lubricating layer thereby obtaining improved blister volume and larger drawing ratio.

4,289,010

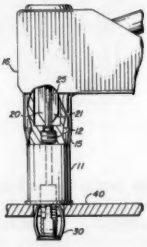
UNIVERSAL ADAPTER FOR SCREW ANCHOR INSTALLATION

Dale R. Badger, 7609 W. Heatherbrae, Phoenix, Ariz. 85033, assignor to Dale R. Badger and Spencer Norman, both of Phoenix, Ariz.

Filed May 12, 1980, Ser. No. 148,921

Int. Cl.³ B21J *15/34*

U.S. Cl. 72—114 **7 Claims**



1. An adapter for modifying an installation tool of the type used to install blind rivets and having internal jaws for gripping and pulling on a pull shaft inserted therebetween in the operation of such tool, said adapter modifying the tool from one for installing blind rivets to one for installing squash nuts and including in combination:

a universal installer head for connection to the tool and having a longitudinal hole therethrough in alignment with the internal jaws of the tool for permitting free passage of a pull shaft through said head; and

a pull shaft having a threaded end for engagement with a squash nut and a jaw engaging end for passage through the hole in said head to a position in the tool where the jaw engaging end may be gripped and pulled by the jaws in the installation tool.

4,289,011

CONTINUOUS PIPE ROLLING PROCESS

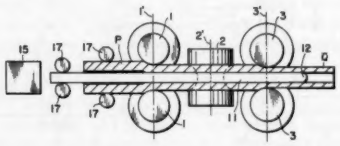
Seishiro Yoshiwara, and Hirokichi Higashiyama, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 14, 1979, Ser. No. 94,316

Claims priority, application Japan, Nov. 17, 1978, 53-141073; Dec. 19, 1978, 53-156666

Int. Cl.³ B21B *17/04*

U.S. Cl. 72—208 **7 Claims**



1. A process of rolling a tubular blank into a pipe by elongation, diameter and wall thickness reduction which comprises

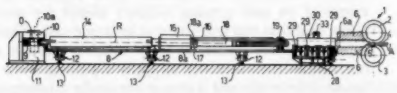
passing the blank continuously through a mill having a plurality of roll sets each comprising grooved driven rolls providing substantially circular passes of progressively reduced diameters, and supporting the interior of the tubular blank with a mandrel during its passage through said roll sets, the improved process comprising holding the tail end of the mandrel with pushing means, starting rolling by pushing the mandrel into the tubular blank, stopping the pushing of the mandrel between the time when the front end of the workpiece has passed the last roll center line in the first half roll set group and the time when the front end of the workpiece has reached before the roll center line of the last roll set and continuing the rolling of the workpiece holding the tail end of the mandrel.

4,289,012

DEVICE FOR INSERTING AND PUSHING A BAR INTO A PRESS-PIERCING MILL

Aurindo Nessi, Albate (Como), Italy, assignor to Innocenti Santeustacchio S.p.A., Brescia, Italy

Filed Nov. 28, 1978, Ser. No. 964,273
Int. Cl.³ B21B *17/06, 25/02*
U.S. Cl. 72—209 **7 Claims**



1. A device whereby a square bar is inserted and pushed into a press-piercing mill (PPM), the bar being disposed along the rolling and drilling axis of the mill, the apparatus being characterised in that it comprises:

a first thrust means (**20**) having a first direction of action (R_1) and thrusting the bar (**7**) at a speed set for introducing the bar into the press-piercing mill (PPM);

a second thrust means (**14**) having a second direction of action (R) and thrusting the bar (**7**) at a speed set for rolling and simultaneously drilling the bar (**7**) in the press-piercing mill (PPM), and

an actuator (**34**) for simultaneously moving the first and second thrust means (**20, 14**) from a position in which the first direction of action (R_1) coincides with the PPM rolling axis (A) and the second direction of action (R) is at a distance from the rolling (A) to a position in which the first direction of action (R_1) is at a distance from the rolling axis (A) and the second direction of action (R) coincides with the axis (A) and vice versa.

4,289,013

CROWN CONTROL FOR ROLLING MILL

Siegfried H. Hunke, Thomaston, Conn., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 29, 1979, Ser. No. 70,783
Int. Cl.³ B21B *29/00, 31/30*
U.S. Cl. 72—243 **5 Claims**

1. In a mill having a housing, a plurality of work rolls and at least one segmented backing bearing for each work roll, the backing bearing portions being supported on a backing bearing shaft through a plurality of saddles resting against the housing, screw-down mechanism associated with each end of the backing bearing shaft, and

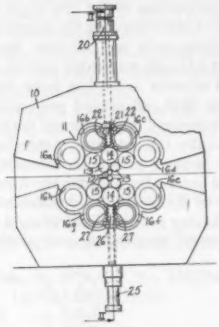
crown adjusting means in line with each saddle, each said means comprising:

an eccentric ring between the shaft and the saddle,

pinion teeth fixed to said eccentric ring,

a rack engageable with said pinion teeth,

a hydraulic cylinder and piston mounted on the housing, the piston being operatively connected to the rack, and



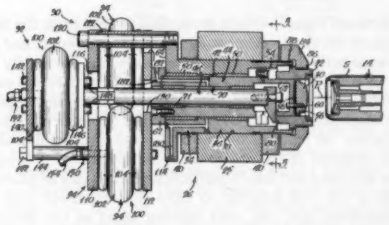
means for coordinated actuation of said cylinders and pistons.

4,289,014

DOUBLE ACTION DOMER ASSEMBLY

Edward G. Maeder, Minnetonka, and John M. Tovey, Circle Pines, both of Minn., assignors to National Can Corporation, Chicago, Ill.

Filed Oct. 11, 1979, Ser. No. 83,950
Int. Cl.³ B21D *22/24*
U.S. Cl. 72—348 **15 Claims**



1. A domer assembly for use with a punch reciprocal along a path on a frame of an ironing machine to reform an end wall of a container comprising a center domer element and an annular element surrounding said center domer element, a domer support member and an annular support member respectively cooperating with said center domer element and said annular element, first compressible means connected with said domer support member and said frame and biasing said domer element toward said punch, second compressible means connected with said annular support member and said frame and biasing said annular element toward said punch, each compressible means comprising an expandable and compressible resilient member with at least one of said compressible means being constantly exposed for visual inspection, and separate pressurizing means for respective compressible means.

4,289,015

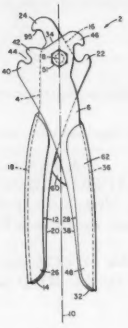
CHAIN LINK TOOL

Thomas M. Porter, Concord, Mass., assignor to H. K. Porter, Inc., Somerville, Mass.

Filed Feb. 29, 1980, Ser. No. 125,972
Int. Cl.³ B21D *37/12*
U.S. Cl. 72—384 **3 Claims**

1. A chain link tool for closing the eye portions of a generally U-shaped cross-chain connecting link about a substantially transversely disposed portion of a side chain and for removing

cross-chain links which are so attached comprising a first lever member and a second lever member, each said lever member including a proximal handle portion and a distal head portion; the distal head portion of the first lever member comprising first and second corresponding flat elements disposed in spaced stacked relation, each said element having a substantially straight outer edge, an inner edge curved away from the outer edge of said element as it rises from the handle portion, a forward edge, first and second projections arising from the section of the forward edge adjacent the inner edge defining a slightly upwardly slanted groove therebetween and a third, downwardly hooked, projection extending outwardly of the section of the outer edge adjacent the forward edge; the distal head portion of the second lever member comprising a single flat element having a substantially straight outer edge, an inner edge curved away from the outer edge of said single element,



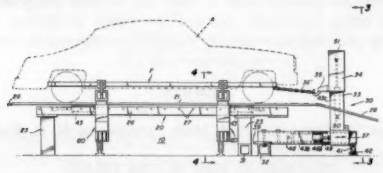
a forward edge, a fourth projection arising from the forward edge of the single element adjacent its inner edge, and a fifth, downwardly hooked projection extending outwardly of the outer edge of the single element adjacent its forward end; said single element of said second lever member being pivotally mounted adjacent the base of the fifth projection to the areas adjacent the bases of the third projection of the first and second elements of the first lever in the space therebetween such that the third and fourth projections form a pair of jaws on one side of the tool adapted to close the respective eyes of the cross-chain link said jaws moving apart as the handles are moved apart and conversely, and such that said groove and said fifth projection on the other side of the tool are adapted to receive the transverse portion of the side chain and grasp the curved end of the cross-chain link respectively when the handles are apart and to disengage the cross-chain connecting link as the handles are moved together.

4,289,016

AUTOMOBILE FRAME ALIGNMENT APPARATUS

Charles E. Hare, 2200 Joppa Rd., Baltimore, Md. 21234

Filed Jul. 25, 1979, Ser. No. 60,473
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—457 **9 Claims**



1. An automobile body and frame straightening apparatus comprising:

an elevated ramp support means for supporting an automobile above the ground;

a plurality of automobile body frame support means to rigidly support the automobile against movement while being repaired; and

at least two automobile body and frame pullers for straightening the body and frame of an automobile;

said ramp support means having a top surface, a pair of sides, first and second ends, and a pair of channel means to support said automobile body frame support means, said channel means positioned under said ramp means top surface and on said sides of said ramp means;

said automobile body frame support means including a channel means supported body, a vertically telescopic means in said body and a horizontally telescopic means supported on said vertically telescopic means, a clamp means on said horizontally telescopic means for engaging and rigidly supporting said automobile frame against movement, where said vertically telescopic means raises said horizontally telescopic means to the height of the automobile frame and said horizontally telescopic means moves said clamp means into position to engage the automobile frame, a ground engaging means on said body means to stabilize said automobile body frame support means;

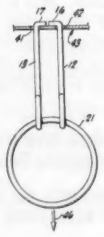
said automobile body and frame puller means including at least one ground support under said first end of said ramp support means, a horizontal beam member pivotally mounted on said ground support means for movement along said first end and along at least one side of said ramp support means, a vertical body member slidable on said horizontal beam member to apply a pulling force to said automobile body and frame, a vertically telescopic member in said vertical body member having means to connect to said automobile body and frame to pull on the damaged area of the automobile, where said horizontal beam member is moved along said ground support means and pivoted to align with the damaged area, and said vertically telescopic member is aligned and connected with the damaged area prior to said vertical body member applying a pulling force to said damaged automobile body and frame.

4,289,017

BODY PULLER

Joseph L. Guidry, 334 Innesbrook St., Santa Rosa, Calif. 95401

Filed Aug. 27, 1979, Ser. No. 70,091
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—462 **5 Claims**



1. A tool for applying a force to the back side of sheet material having at least one aperture therein comprising

a ring, and

first and second arms having the inner ends thereof looped about said ring for sliding engagement therewith,

said arms each having a lateral projection at the outer end thereof with such projections extending in opposite directions normal to the plane of the looped end of the arm from which the projection extends,

whereby insertion of the outer ends of the arms through an

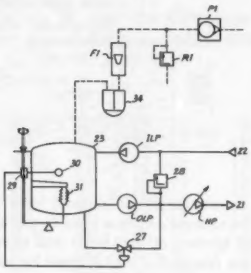
aperture in sheet material and pulling said ring away from the material will cause the projections on said arms to rotate into opposed alignment engaging the backside of said material.

4,289,018

METHOD AND APPARATUS FOR MEASURING DEGASIFICATION

Olivier Hellouin de Menibus, Etampes, France, assignor to AMS, S.A., Fresnes, France

Filed Aug. 16, 1979, Ser. No. 67,113
Int. Cl.³ G01N *7/14*
U.S. Cl. 73—19 **7 Claims**



1. A method of measuring the amount of gas in a liquid system which comprises a tank and a vacuum pump, said method comprising the steps of:

(a) maintaining the temperature of said system at a predetermined level;

(b) operating said pump to exert a predetermined level of suction over said liquid to desolubilize gas from said liquid;

(c) separating said desolubilized gas leaving said liquid from said liquid by a gas-liquid separator;

(d) measuring the flow rate of said separated gas from said separator; and

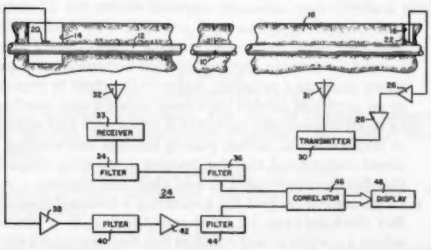
(e) determining the amount of gas remaining in said liquid as a function of said flow rate.

4,289,019

METHOD AND MEANS OF PASSIVE DETECTION OF LEAKS IN BURIED PIPES

Thomas N. Claytor, Woodridge, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 30, 1979, Ser. No. 89,346
Int. Cl.³ G01M *3/24*
U.S. Cl. 73—40.5 A **9 Claims**



1. A method of detecting the location of a leak in a buried pipe that contains a fluid, the method comprising the steps of:

detecting acoustic waves of a first particular type produced by the leak and propagated to a first location;

detecting acoustic waves of a second particular type produced by the leak and propagated to a second location;

transmitting the detected acoustic waves from the second location to the first location; and

determining a cross-correlation between the detected acoustic waves from the first location and the detected acoustic waves from the second location;

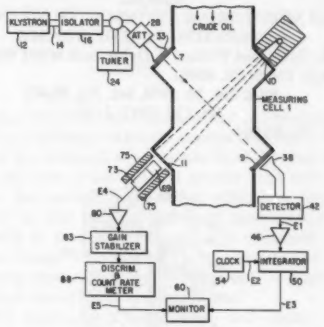
which cross-correlation is a measure of the location of the leak with respect to the first and second locations.

4,289,020

MICROWAVE-GAMMA RAY WATER IN CRUDE MONITOR

Hans J. Paap, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,584
Int. Cl.³ G01N *22/00*
U.S. Cl. 73—61.1 R **10 Claims**



1. A system for measuring the percent quantity of water in crude oil flowing in a pipe line comprising cell means arranged with pipe line so that the crude oil flows through the cell means, microwave transmission means spatially arranged with the cell means for transmitting microwave energy through the crude oil flowing through the cell means, source means spacially related to the cell means for emitting gamma rays through the crude oil flowing through the cell means, receiver means spatially arranged with the cell means for receiving the transmitted energy and for providing a signal corresponding to the received microwave energy, detector means for detecting the gamma rays that passed through the crude oil and providing a corresponding signal, and monitor means connected to the receiver means and to the detector means for providing an indication of the quantity of water in the crude oil.

4,289,021

TONGS HAVING TORQUE INDICATOR THEREON

Paul M. Nelson, Houston, Tex., assignor to Wilson Industries, Inc., Houston, Tex.

Filed Aug. 16, 1979, Ser. No. 67,181
Int. Cl.³ G01L *5/24*
U.S. Cl. 73—862.25 **7 Claims**

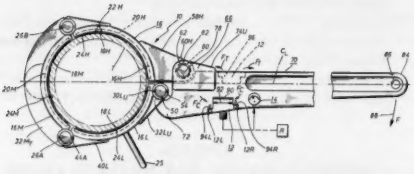
1. A tongs for making and breaking a joint between adjacent threaded members in oil field applications, comprising:

jaws for grippingly engaging one of the threaded members;

a handle by which an actuating force is applied to the jaws to effect the making or breaking of the joint, the handle having a cut-out portion therein, the cut-out portion being disposed in the extremity of the handle proximal the jaws;

a single sensing unit mounted within the cut-out portion in a force-receiving relationship with respect to the handle for generating a signal functionally related to the force applied to the handle to effect the making or breaking of the

joint, the sensing unit being free to move slightly in a lateral direction both perpendicular to and parallel to the longitudinal axis of the handle and in a direction both forward and away from the handle; and



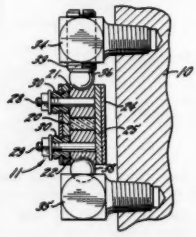
a readout device responsive to the signal generated by the sensing unit for generating a visual indication in predetermined units representative of the magnitude of the actuating force applied to the handle.

4,289,022

LOAD MONITORING SYSTEM WITH MEANS FOR GENERATING TIMING SIGNALS

Frank R. Dybel, and William P. Dybel, both of 981 Wingate Rd., Olympia Fields, Ill. 60461

Filed Jul. 20, 1979, Ser. No. 59,471
Int. Cl.³ G01L *1/16*
U.S. Cl. 73—862.64 **7 Claims**



1. A load monitoring system for monitoring loads that are cyclically applied to a force carrying member comprising:

(a) a transducer mounted on the force carrying member for generating an electrical load signal substantially proportional to the load exerted on the force carrying member; and

(b) timing signal generating means including a plurality of timers connected in cascade fashion, each timer operable to produce a timing signal output, the first of the cascaded timers being initiated by the load signal generated by the transducer to produce timing signals in predetermined timed relationship to the application of the load to the force carrying member.

4,289,023

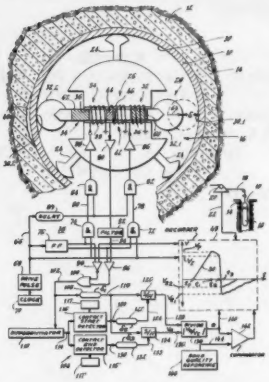
PERCUSSION METHOD AND APPARATUS FOR THE INVESTIGATION OF A CASING CEMENT IN A BOREHOLE

Dennis Rader, Houston, Tex., assignor to Schlumberger Technology Corp., New York, N.Y.

Filed Sep. 19, 1979, Ser. No. 76,834
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **19 Claims**

1. A method for evaluating the cement bond behind a casing cemented in a borehole, comprising the steps of

applying an impulse to an element disposed to impact on a segment of an inner surface of the casing to bounce the element off said surface, said impulse terminating prior to contact of the element with the inner casing surface so that said element is moving freely prior to contact with the casing; and



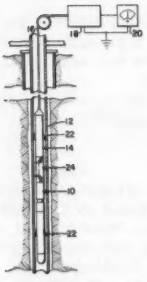
measuring the motion of the element for a time period including the element's motion prior to and after the bouncing of said element off said inner wall to enable measurement of the rebound of said element by said casing.

4,289,024

WELL CASING FREE-POINT INDICATOR

Edward R. Basham, Fort Worth, and L. Max Mosely, Arlington, both of Tex., assignors to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Dec. 26, 1979, Ser. No. 107,332
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **10 Claims**



1. In a free-point locator apparatus adapted to sense strain imposed by stress applied to well conduit the combination of:

(a) a closed loop armature disposed within the downhole tool of said apparatus and provided with at least one winding, with each said winding respectively would around an arcuate segment of said armature to respectively generate a pulsating magnetic flux field in response to an electrical current impressed through said winding;

(b) a diode respectively provided in series with said winding to limit electrical current passing through said winding to direct current and thereby develop a pulsating magnetic flux field corresponding to said electrical current;

(c) a permanent magnet for generating a constant magnetic flux field between its poles and disposed in a position where a portion of said constant flux field occupies a space common with a portion of said pulsating flux field for mutual influence therebetween; and

(d) said constant flux field and said pulsating flux field being

relatively positioned in a sense such that the resulting electrical current passing through each said winding is a pulsating direct current of a designated amplitude which changes corresponding to change in position between said permanent magnet and said armature;

(e) said resulting current being adapted to pass through a conductor from each said winding to the earth's surface.

4,289,025

SONDE WITH ROTATABLE PAD FOR CARRYING OUT LOGGING MEASUREMENTS IN A BOREHOLE

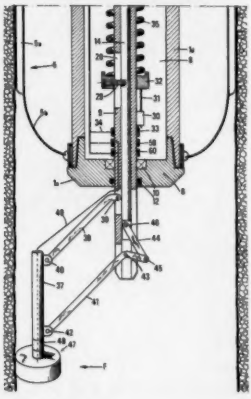
Guy Norel, La Celle Saint Cloud, and Robert Desbrandes, Sevres, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 11, 1980, Ser. No. 120,037

Claims priority, application France, Feb. 9, 1979, 79/03565

Int. Cl.³ E21B *49/00*

U.S. Cl. 73—152 **7 Claims**



1. A sonde for carrying out logging measurements in a borehole, comprising a body having an outer diameter smaller than the diameter of the borehole, means for centering said sonde body in the borehole, at least one measuring device comprising a transducer, handling means for displacing said measuring device from a position of contact with the borehole wall to a position spaced apart from said wall and vice-versa, means for rotating said measuring device about the sonde axis, means for detecting the angular position of said measuring device with respect to a reference direction, and connecting means for transmitting the signals delivered by the sonde, wherein said measuring device comprises a shaft whose axis, maintained in a plane parallel to the sonde axis is inclined to said axis by an angle comprised between 0° and 90°, and at least one wheel carried by said shaft and freely rotatable thereabout, said wheel delimiting a sealed chamber whose characteristics are accurately known, said transducer being carried by said shaft within said wheel.

4,289,026

LEVEL INDICATING DEVICE

Jürgen Neumann, Liederbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 28, 1979, Ser. No. 79,932

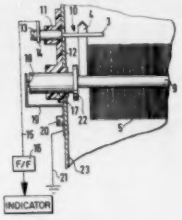
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1978, 2843937

Int. Cl.³ G01F *23/00*; G03G *15/08*

U.S. Cl. 73—290 R **11 Claims**

1. An electrostatic copying apparatus which includes a device for indicating that the level of a dosable material has fallen below a predetermined level in a dosing container having a shaft mounted horizontally for rotation inside of the container and a dosing brush having a radius mounted on the shaft, said level indicating device comprising:

an elastic contact tongue radially fixed to the shaft for rotation therewith, said contact tongue having an overall length which is greater than the radius of the brush, said contact tongue being sufficiently elastic so that it assumes a bent configuration under the drag of the dosable material, the bent configuration having a first radius when rotated in contact over a predetermined portion of its length with the dosable material, and so that it assumes an extended configuration having a second radius when



rotated so that it is not in contact over said predetermined portion of its length with the dosable material;

a contact pin mounted at a distance from the shaft greater than said first radius but not greater than said second radius, said second radius being sufficiently large with respect to said distance at which said contact pin is mounted so that said contact pin is contacted by said contact tongue in its extended configuration, said contact pin being mounted stationary on one of the walls of the container above the dosing brush; and

means for producing a signal when said contact tongue contacts said contact pin.

4,289,027

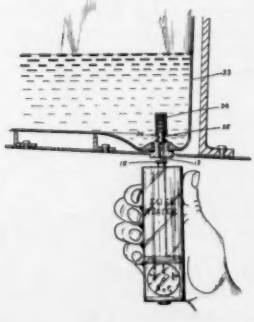
AIRCRAFT FUEL TESTER

Donald Gleaves, 50 Somerset St., Huntington Station, N.Y. 11746, and Walter Green, 6001 Arlington Blvd, Apt. 406, Falls Church, Va. 22046

Filed Dec. 20, 1979, Ser. No. 104,771

Int. Cl.³ G01F *23/14*

U.S. Cl. 73—299 **8 Claims**



1. A guage to measure fuel level in the fuel tanks of high wing airplanes where the gauge used to measure fuel level has a mechanism which is activated by means of the fuel pressure against it and which in turn activates a pointer on a dial which indicates the level of fuel in the tank wherein the improvement comprises:

(a) a hollow standpipe, with the upper end narrowing down to a perforated pin slightly smaller than the opening in the fuel tank sump valve, when the pin is pushed into the opening of the wing tank sump valve, and

(b) which when pushed into the wing tank sump valve opens the valve sufficiently to allow fuel to flow into the opening in which the pin is inserted and through the perforations in the pin into the hollow standpipe while a collar fits tight against the opening in the valve preventing fluid from leaking out, and

(c) and continues to flow down through the standpipe through the opening in the base where it presses against a pressure means mechanism with the full weight of the level of fuel in the fuel tank, and

(d) which pressure means mechanism moves an indicator means registering the level of fuel in the wing tank, and

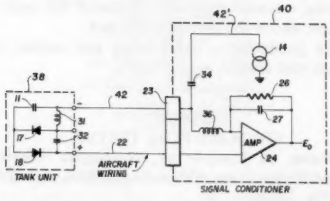
(e) which measurement of the fuel level in the high wing fuel tanks is taken by inserting the device into the fuel tank sump valve while standing under the wing of the aircraft.

4,289,028

FUEL QUANTITY GAUGE

Irwin Wallman, Shelburne, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Dec. 27, 1979, Ser. No. 107,679
Int. Cl.³ G01F *23/26*
U.S. Cl. 73—304 C **5 Claims**



1. A capacitance type fuel quantity gauge for a fuel tank, comprising in combination:

a tank unit, including: a probe capacitor, the capacitance of which varies in accordance with the fuel quantity gauged; a pair of oppositely poled diodes, each having a side connected to one side of the probe capacitor; AC blocking means connected to the opposite side of the probe capacitor and to the other side of one of the diodes; and DC blocking means connected between the other side of the diodes;

a signal conditioner, including: AC voltage source; signal processing means; DC blocking means connected to the AC voltage source and the signal processing means; and AC blocking means connected to the DC blocking means of the signal conditioner and to the signal processing means; and

a conductor connected to the connection of the DC blocking means of the tank unit to one of the pair of diodes and to the signal processing means; and

a multiplexing conductor connected to the connection of the AC blocking means of the tank unit to the opposite side of the probe capacitor and to the AC blocking means and DC blocking means of the signal conditioner,

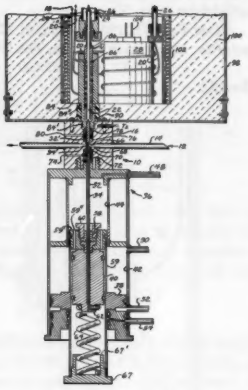
whereby the AC signal voltage from the AC signal source and the DC signal return voltage from of the diodes are carried by the multiplexing conductor.

4,289,029

HIGH TEMPERATURE INJECTION AND VAPORIZATION SYSTEM FOR GAS CHROMATOGRAPHY

Robert W. Sampson, Arlington Heights, and Francis H. Franke, Elk Grove Village, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Nov. 2, 1979, Ser. No. 90,818
Int. Cl.³ G01N *1/14*
U.S. Cl. 73—863.11 **11 Claims**

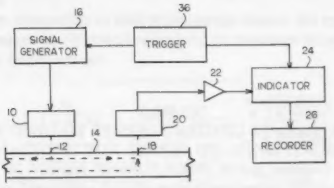


1. A gas chromatograph injection system for injecting a measured sample of fluid from a relatively low temperature sample stream into a relatively high temperature vaporization zone through which a carrier gas is flowing comprising a sample block having inlet and outlet ports for the sample stream and a sample flow channel portion therebetween, a tubular closed end syringe member having an aperture in the side thereof immediately adjacent its closed end and a plunger selectively movable toward and away from said closed end to draw fluid samples of a predetermined volume into said syringe through said aperture, packing and guiding means in said sample block to guide the movement of said tubular syringe member on opposite sides of said sample flow channel and prevent leakage, means for partially withdrawing said plunger while said syringe aperture is in the flow channel to collect a measured volume of sample, means to move said syringe and withdrawn plunger together into said vaporization zone, means to force said plunger toward said closed end to expel all of said measured sample into said vaporization zone, means to return said syringe and plunger to its original position, means to heat said vaporization zone to a temperature of at least 450° F., means to fixedly mount said vaporization zone closely adjacent to and in closed communication with said sample block and in axial alignment with the path of movement of said syringe member while insulating it so that when the temperature of all surface areas in the vaporization zone which contact the sample vapor is greater than 450° F. the temperature in the sample block will not exceed about 400° F., said vaporization zone being contained within an enlarged cross-sectioned portion of a heat conductive member, said member being joined to said sample block by a portion of reduced cross-section, and thermal insulation means surrounding said member along a portion thereof which is intermediate said portion of enlarged cross-section and said sample block.

4,289,030
NONDESTRUCTIVE TESTING UTILIZING HORIZONTALLY POLARIZED SHEAR WAVES

George A. Alers, Albuquerque, N. Mex.; Robert B. Thompson, and Carmine F. Vasile, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 1, 1979, Ser. No. 63,027
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—588 7 Claims



1. A nondestructive test method for detecting ... imperfection in an object near a symmetric discontinuity, comprising the steps of:

generating a horizontally polarized shear wave in the object and directed toward the symmetric discontinuity; and

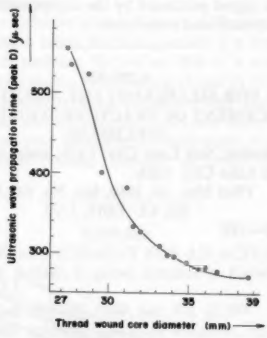
monitoring the object to detect a horizontally polarized shear wave reflected from the imperfection,

the method thereby being adapted to detect imperfections in the object which reflect a horizontally polarized shear wave, while exhibiting relative insensitivity to the presence in the object of discontinuities which do not reflect a horizontally polarized shear wave.

4,289,031
METHOD OF MEASURING HARDNESS OF FLEXIBLE THREAD-WOUND GOLF BALLS OR INNER CORES THEREOF

Ichiro Tominaga, and Teruo Sasaki, both of Kobe, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Oct. 31, 1979, Ser. No. 89,733
Claims priority, application Japan, Nov. 4, 1978, 53-136103
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—597 6 Claims

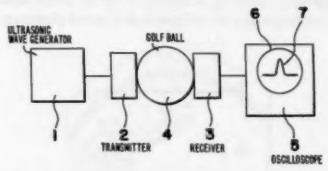


1. A method of measuring hardness of a flexible thread-wound golf ball which comprises the steps of holding the flexible thread wound golf ball to be measured between a transmitter coupled to means for oscillating ultrasonic wave and a receiver coupled to means for detecting the ultrasonic wave received by said receiver, applying from said transmitter, the ultrasonic wave having predetermined frequency to said flexible thread-wound golf ball, and measuring the hardness of said flexible thread-wound golf ball selectively by or based on the propagation time of the ultrasonic wave passing through the central portion of said flexible thread-wound golf ball.

4,289,032
METHOD OF DISCRIMINATING KINDS OF GOLF BALLS

Ichiro Tominaga, and Teruo Sasaki, both of Kobe, Japan, assignors to Sumitomo Rubber Industries, Inc., Kobe, Japan

Filed Oct. 31, 1979, Ser. No. 89,736
Claims priority, application Japan, Nov. 8, 1978, 53-137638
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—599 5 Claims

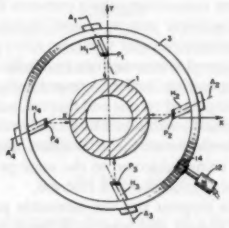


1. A method of discriminating solid golf balls from thread-wound golf balls which comprises the steps of holding the golf ball to be discriminated between a transmitter coupled to means for oscillating ultrasonic wave and a receiver coupled to means for detecting the ultrasonic wave received by said receiver, applying from said transmitter, the ultrasonic wave having a frequency which can propagate through said solid golf ball, but can not propagate through said thread-wound golf ball, to said golf ball to be discriminated, and detecting presence of the ultrasonic wave reaching said receiver through said golf ball to be discriminated by said ultrasonic wave detecting means.

4,289,033
ULTRASONIC TEST APPARATUS FOR TUBES AND RODS

Reinhard Prause, St. Augustin, and Udo Schlengermann, Erftstadt, both of Fed. Rep. of Germany, assignors to Krautkramer-Branson, Inc., Stratford, Conn.

Filed Feb. 19, 1980, Ser. No. 122,027
Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2820142
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—622 5 Claims



1. An ultrasonic test apparatus for testing tubes and rods in which ultrasonic energy after traversing a coupling medium obliquely enters the surface of the respective workpiece and is propagated therein comprising:

transducer means disposed for transmitting ultrasonic energy toward the workpiece to be tested;

mounting means for supporting said transducer means and causing said transducer means to be adjustably movable along an axis which is inclined by an angle ω relative to a

perpendicular axis intersecting the surface of the workpiece;

said angle ω when testng tubes substantially corresponding to the angle of incidence α of the ultrasonic energy upon the workpiece and which for a maximum predetermined wall thickness to diameter ratio of the tubes provides an angle of refraction β of the ultrasonic energy, and when testing rods the angle α is selected to provide an angle of refraction β of greater than 35°, and

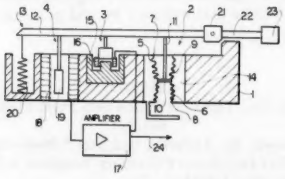
said transducer means being spaced from the workpiece surface for causing the transit time of the ultrasonic energy in the coupling medium to be longer than the maximum transit time of the ultrasonic energy in the workpiece.

4,289,034

DEVICE FOR CONVERTING PNEUMATIC OR HYDRAULIC PRESSURE INTO AN ELECTRIC CURRENT AND VICE VERSA

Lorenz Twisselmann, Isernhagen, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 17, 1979, Ser. No. 4,131
Int. Cl.³ G01L 9/10
U.S. Cl. 73—701 **12 Claims**



1. In a device for converting one signal into another signal according to a compensation principle, with a pressure transducer with a pressure-dependent moveable element, an electromagnetic force transducer, a moveable part of the force transducer standing in connection with the element, and a position indicator transmitter which converts the movement of the pressure transducer into a control signal for one of the transducers, the improvement wherein

the pressure transducer comprises two bellows with slightly different operative surfaces respectively, each of said surfaces being fixed on one end thereof, and the other ends of said operative surfaces being connected with one another and with the moveable element, and

said surfaces being subjected to the same pressure,

a lever rotatably mounted at a fulcrum,

said moveable element and the moveable part of the force transducer engage said lever at different positions of said lever and said position indicator transmitter has a moveable part, the latter engages said lever at another position of said lever remote from said fulcrum,

said lever has two arms, a single of said arms respectively being on each side of said fulcrum,

the moveable element, the moveable part of the force transducer, and said moveable part of said position indicator transmitter engage on one of said arms of said lever, and

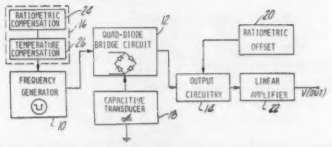
a counterweight is disposed on the other of said arms of said lever.

4,289,035

COMPENSATED CAPACITIVE TRANSDUCER DEMODULATOR CIRCUIT

Chen Y. Lee, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 878,056, Feb. 15, 1978, abandoned.
This application Nov. 30, 1978, Ser. No. 965,453
Int. Cl.³ G01L 19/04
U.S. Cl. 73—708 **21 Claims**



1. A capacitive transducer and demodulator combination circuit comprising:

a capacitive transducer for measuring the variances of a physical parameter, said transducer adapted to transform the variances into changes of capacitance of the transducer;

a frequency generator means for supplying an alternating carrier voltage;

a quad-diode demodulator electrically connected to receive from said frequency generator means the alternating carrier voltage and further connected to said transducer such that the changes in capacitance modulate said carrier, said demodulator detecting said carrier and generating an output voltage signal representative of the variances in the measured physical parameter; and

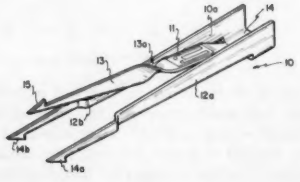
compensation network means, electrically connected to said frequency generator, for varying the amplitude of the carrier voltage oppositely to the amplitude changes in the output signal produced by the compensable errors of the demodulator and transducer.

4,289,036

GAUGE FOR MEASURING THE MOUTH OPENING DISPLACEMENT OF FRACTURE TOUGHNESS TEST SPECIMENS

Lynn M. Barker, Salt Lake City, Utah, assignor to Terra Tek, Inc., Salt Lake City, Utah

Filed Mar. 24, 1980, Ser. No. 133,524
Int. Cl.³ G01L 1/22
U.S. Cl. 73—799 **4 Claims**



1. A gauge for measuring the mouth opening displacement of fracture toughness test specimens consisting of,

a clip gauge formed from a single sheet of suitable material

that is cut and bent appropriately to form a base wherefrom center and outside prongs extend in essentially parallel planes;

means secured to the prong ends opposite to said base for directly engaging opposite slot faces across a test specimen mouth;

strain gauge means secured to said center prong so as to sense flexure thereof as a change in electrical resistance; and

means, connected to said strain gauge means, for translating changes in electrical resistance to specimen mouth opening displacement.

4,289,037

METHOD OF STRESS GRADING TIMBER, AND MACHINE FOR STRESS GRADING TIMBER

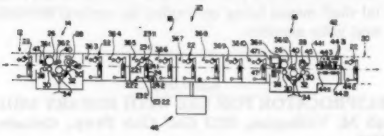
George W. Vinopal, Pretoria, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Filed Jan. 29, 1980, Ser. No. 116,433

Claims priority, application South Africa, Feb. 7, 1979, 79/0530

Int. Cl.³ G01N *3/32*

U.S. Cl. 73—808 **14 Claims**



1. A method of stress grading timber which comprises:

continuously moving a length of timber;

stressing the moving length by applying a transverse load thereto, the length being supported by two supports between which the load is applied and the load causing a deflection of the timber length;

measuring the load and/or deflection;

stressing the moving length differently by thereafter applying a different load to the timber length at the same position while supported in the same fashion to obtain a different deflection; and

measuring the different load and/or the different deflection;

the timber length being freely supported as a simple beam during each stressing thereof so that it is substantially unconstrained during the stressing except by the load and the two supports between which the load is applied, the original load and the original deflection being related to the different load and different deflection according to predetermined criteria, thereby to grade the timber length.

4,289,038

FAIL-SAFE ATTACHMENT FOR AN ACTUATOR

Donald L. Hore, Bristol, England, assignor to Rotork Limited, Bath, England

Filed Mar. 19, 1979, Ser. No. 22,056

Claims priority, application United Kingdom, Apr. 7, 1978, 13758/78

Int. Cl.³ G05G *17/00*; F03G *1/00*

U.S. Cl. 74—2 **9 Claims**

1. A part-turn actuator having a rotatable output member and a cam plate mounted on said output member for rotation therewith to actuate at least one switch for the control of the actuator, said actuator having a fail-safe mechanism comprising:

a rotatable spring operated cam plate coupling;

means for manually setting said spring and for rotating said cam plate coupling in one direction of rotation to an inoperative position;

latch means for holding said cam plate coupling in said inoperative position;

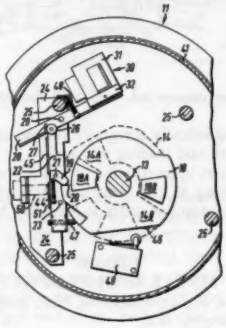
said fail-safe mechanism being independent of the normal operation of the actuator when said cam plate coupling is held in its inoperative position;

said latch means comprising:

a first movable lever positioned by electrical means;

a second movable lever having one end engageable with said first movable lever, a pawl pivotally mounted to said lever;

said electrical means, when energized, holding said first movable lever in an inoperative position urging said second movable lever in a direction for engaging said pawl to



said cam plate coupling, latching it in an inoperative position, said pawl being pivotally movable to allow rotation of said cam plate coupling in said one direction of movement to latch said cam plate coupling by said pawl in its inoperative position, said mechanism being rendered operative by an interruption of electrical current to said electrical means, the deenergization of said electrical means releasing said first movable lever to allow movement of said first movable lever from its inoperative position to a position for releasing said second lever disengaging said pawl, whereby said cam plate coupling is released so as to rotate in its other direction to engage drivably the switch cam plate moving the output member of the actuator to a predetermined fail-safe position by the stored energy of the spring force.

4,289,039

RELEASE MECHANISM FOR A VALVE OF A FIRE EXTINGUISHING INSTALLATION

Josef Trunner, Mönchaltorf, and Marinus Both, Männedorf, both of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Apr. 2, 1979, Ser. No. 26,053

Claims priority, application Switzerland, Apr. 10, 1978, 3814/78

Int. Cl.³ F16K *31/56*

U.S. Cl. 74—2 **8 Claims**

1. A release mechanism for a valve of a fire extinguishing installation having a linearly movable element which, upon release of a pre-biased spring, moves out of a rest position and actuates the valve, comprising:

two cooperating mutually spaced ball pressure plates;

a spring defining said pre-biased spring cooperating with said ball pressure plates;

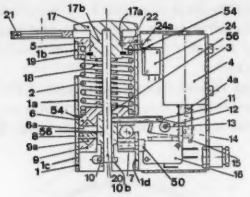
a plurality of balls arranged between said ball pressure plates for maintaining said ball pressure plates in spaced relationship from one another and for biasing said spring;

each of said ball pressure plates have recesses for receiving said balls;

said ball pressure plates being rotatable relative to one another so that said balls latch into said recesses of the ball pressure plates and enable the spring to at least partially relax;

said spring comprising a helical spring which in its biased state is loaded both in axial compression and in torsion;

one of said ball pressure plates defining a movable ball pressure plate;



a loading pin connected with said movable ball pressure plate;

an electromagnetically actuatable release catch means cooperating with said loading pin; and

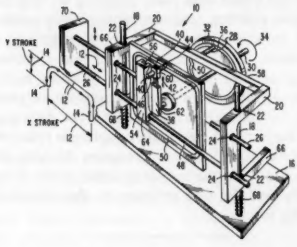
said loading pin, upon rotation of said movable ball pressure plate, latching at said electromagnetically actuatable release catch means in order to load said helical spring.

4,289,040

LINEAR MOTION DEVICE

Michael Haluko, Jr., Lawrenceville, N.J., assignor to Kinematics, Inc., Princeton, N.J.

Filed Aug. 27, 1979, Ser. No. 70,088
Int. Cl.³ F16H *25/12, 37/12*
U.S. Cl. 74—50 **15 Claims**



1. A linear motion device, for providing a lateral movement stroke and a selective vertical lifting and dropping, which comprises:

(a) a base member;

(b) a vertical shaft means fixedly secured with respect to said base member and extending vertically upward therefrom;

(c) a yoke member movably secured to said vertical shaft means to allow vertical movement of said yoke member therealong, said yoke member including a yoke pin extending outwardly therefrom;

(d) a drive shaft being rotatably driven;

(e) a lift cam means fixedly secured with respect to said drive shaft to be rotatably movable therewith, said lift cam defining a lift channel therein positioned to receive said yoke pin of said yoke member therein to operably control the vertical movement of said yoke member along said vertical shaft means responsive to the profile of said lift channel defined within said lift cam means;

(f) a crank means secured to said drive shaft to be rotatable therewith, said crank means including a crank pin being radially reciprocally movable with respect to said crank shaft, said crank pin also being rotatably movable responsive to rotation of said crank means and said crank shaft, said crank pin including a first projection and a second projection;

(g) a plate cam fixedly secured with respect to said base member, said plate cam defining a plate cam channel therein adapted to receive said first projection of said crank pin therein to operably control the radial reciprocation of said crank pin with respect to said crank shaft, during rotation thereof, responsive to the profile of said plate cam channel;

(h) a horizontal shaft means movably secured with respect to said yoke member to allow relative horizontal movement with respect thereto, said horizontal shaft means being vertically movable responsive to vertical movement of said yoke member; and

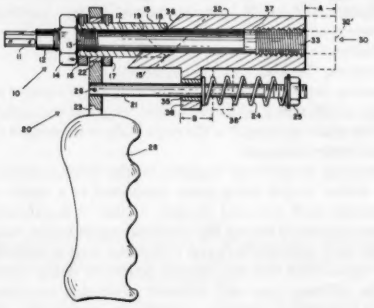
(i) a vertical guide means fixedly secured to said horizontal shaft means to be horizontally and vertically movable therewith, said vertical guide means defining a vertical guide channel therein adapted to receive said second projection of said crank pin therein, said vertical guide channel extending in a vertical direction to cause horizontal movement of said horizontal shaft means responsive to the horizontal component of movement of said second projection of said crank pin and to prevent vertical movement of said horizontal shaft means responsive to the vertical component of movement of said second projection of said crank pin, vertical movement of said horizontal shaft means being controlled by vertical movement of said yoke member.

4,289,041

RECIPROCATOR FOR USE WITH ROTARY DRILLS

Joseph M. Valdespino, 5023 Golf Club Pkwy., Orlando, Fla. 38208

Filed May 4, 1979, Ser. No. 36,096
Int. Cl.³ F16H *25/12, 25/16*
U.S. Cl. 74—56 **2 Claims**



1. A device for driving a tool with a reciprocating motion and adapted to be operated from a rotary power source comprising:

a stationary frame having a shaft bearing therein;

a hand grip attached to said frame for holding of said device by a user;

a cylindrical sleeve-like eccentric member having an angular forward surface, said forward surface cut at a selected acute angle with respect to the longitudinal axis of said eccentric member with the periphery, formed by the junction of said cylindrical eccentric member and the face formed by said forward surface cut, being rounded to form a broad contact area, said eccentric member disposed on and concentric with said shaft and rigidly attached thereto, said shaft and said eccentric disposed in said shaft bearing and rotatable with respect thereto, said front end of said shaft projecting from said angular forward surface;

a cylindrical sleeve-like tool driving member having an angular rear surface thereof cut at said selected acute angle, and a forward end having internal threads therein for accepting a tool holding chuck, said driving member slidably disposed on and concentric with said front end of said shaft, said driving member having a diameter greater than the diameter of said eccentric member;

a downward projecting slide block attached to said cylindrical driving member, said slide block having a rod bearing therethrough;

a guide rod attached to said frame and slidably engaged with said rod bearing of said slide block; and

an external, adjustable compression spring, connected to said guide rod and said slide block, and adapted to urge said angular rear surface of said driving member into contact with said broad contact area of said eccentric member, said spring adjustable to vary the length of the reciprocating stroke of said tool;

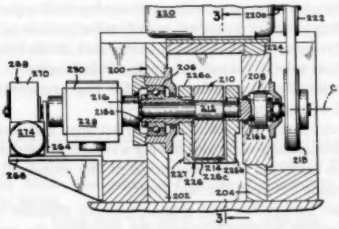
whereby rotation of said shaft causes said broad contact area of said eccentric member to rotate against said angular rear surface of said driving member so as to slide said driving member alternately forward on said shaft against the compression of said spring and rearward on said shaft in response to the tension in said spring, thereby resulting in a longitudinally reciprocating motion of said driving member.

4,289,042

VIBRATOR WITH ECCENTRIC WEIGHTS

William R. Brown, Blairsville, Pa., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 899,042, Apr. 24, 1978, Pat. No. 4,211,121, which is a division of Ser. No. 719,634, Sep. 1, 1976, abandoned.
This application Mar. 19, 1979, Ser. No. 21,388
Int. Cl.³ F16H *33/00, 1/30*
U.S. Cl. 74—61 **7 Claims**



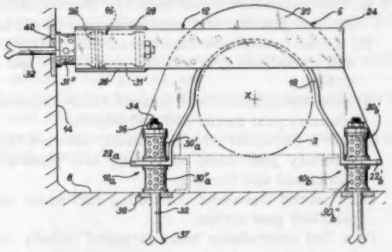
1. A vibrator comprising a gearbox, a first rotatable shaft member terminating at said gearbox, a first eccentric weight connected to said first shaft member, a rotatable hollow shaft member mounted on the first shaft member and terminating at the gearbox, a second eccentric weight connected to said hollow shaft member, means to drive one of said rotatable members, a first control shaft and a second control shaft coaxially mounted in said gearbox on an axis common to the rotatable shaft members, a first bevel gear train in said gearbox connecting said first control shaft to said first rotatable shaft member and a second bevel gear train in said gearbox connecting said second control shaft to said rotatable hollow shaft member.

4,289,043

PROTECTIVE DEVICE FOR AN INERTIA WHEEL ROTATING

Andre Chabre, 74 Rue Dombasle, 75075 Paris; Gerard de Saint-Ours, Cote de Chantepie, Chals Saint Mars 91780, and Bernard Vrillon, 15 rue des Ecoles, 91320 Wissous, all of France

Filed Jan. 24, 1979, Ser. No. 6,122
Claims priority, application France, Jan. 30, 1978, 78 02497
Int. Cl.³ F16P *1/00*
U.S. Cl. 74—609 **3 Claims**



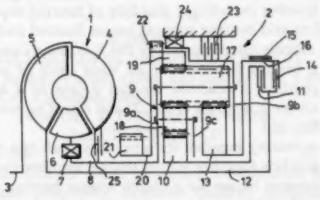
1. A protective device for an inertia wheel rotatable about an axis and being mounted inside an enclosure comprising, at least two anchoring frames, wherein: said device is provided with a cowling of generally semi-cylindrical form having an axis parallel to said wheel and which surrounds the latter, said cowling being further defined respectively by first and second longitudinal edges and a top, said device also comprising a horizontal arm having first and second ends, said first end being rigidly fixed near the top of said cowling and at least three shock absorber assemblies, a first of the said assemblies being fixed between the second end of the said arm and one of said frames and operating in a horizontal direction, a second and third of said assemblies of said shock absorbers being fixed between said first and second edges of the said cowling and another of said frames and being operable in directions perpendicular to the said arm, and each of said respective shock absorber assemblies being operable in both directions.

4,289,044

MOTOR VEHICLE TRANSMISSION

Heinz Dorpmund, Wolfsburg, and Gerd Oberpichler, Brunswick, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,904
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830543
Int. Cl.³ F16H *47/08, 57/10*
U.S. Cl. 74—688 **5 Claims**



1. A motor vehicle transmission comprising:

(1) a hydrodynamic torque converter including a driving impeller connected to an input shaft, a stator and and output turbine;

(2) and a planetary gear train and control system in a stationary gear housing, including:

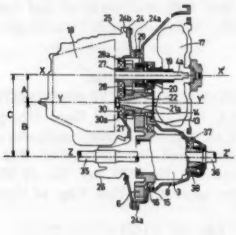
(a) a first sun gear;
(b) a second sun gear arranged on the side of said first sun gear away from said torque converter;
(c) an inertial ring gear having a power output;
(d) a planetary gear carrier;
(e) a first planetary gear mounted on said planetary gear carrier and meshing with said first sun gear;
(f) a second planetary gear mounted on said planetary gear carrier and meshing with said first planetary gear, said second sun gear and said inertial gear;
(g) first controllable clutch means for interconnecting said first sun gear and said impeller by said output turbine;
(h) second controllable clutch means for interconnecting said second sun gear and said impeller by said output turbine;
(i) third controllable clutch means for interconnecting said planetary gear carrier and said impeller;
(j) a first freewheel arranged radially outward from said planetary gear train, connecting said planetary gear carrier and said housing;
(k) a second freewheel connecting said stator and said planetary gear carrier;
(l) a first controllable brake arranged radially outward from said gear train and selectively connecting said housing and said planetary gear carrier;
(m) and a second controllable brake arranged on the side of said gear train away from said torque converter and selectively connecting said housing and said second sun gear.

4,289,045

HOUSINGS OF GEARBOXES FOR POWER UNITS

Roger Brisabois, Clamart, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 30, 1978, Ser. No. 873,575
Claims priority, application France, Jan. 31, 1977, 77 02560; Sep. 14, 1977, 77 27809
Int. Cl.³ F16H *37/08, 57/02*
U.S. Cl. 74—701 **30 Claims**



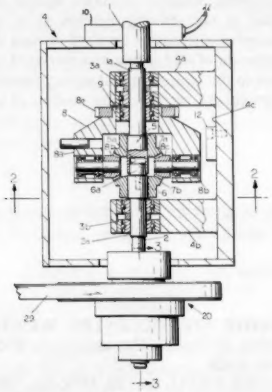
1. A housing for a transmission which includes a gearbox, coupling means and a differential with a crown gear and shaft, said housing including a plurality of bearing support means,
a first said bearing support means located and configured to receive interchangeably the following components:
I. a bearing member for an input shaft of an automatic gearbox, a reaction support means of a hydrokinetic torque converter (FIG. 2) and a sealing member therefor, and
II. a bearing member for a primary shaft of a manual-shift gearbox together with a sealing member therefor and a support means for a clutch release bearing assembly;
a second said bearing support means being located and configured to support interchangeably the following components:
III. one end of an intermediate pinion means coupling said automatic gearbox with said crown gear of the differential, and
IV. an end pinion of a secondary shaft of said manual-shift gearbox coupling said gearbox with said crown gear of the differential;
third and fourth said bearing support means, each being located and configured to receive bearings for supporting the crown gear for rotation, whereby said housing may be used for a manual shift gearbox together with a mechanical clutch as well as for an automatic gearbox with a hydrokinetic torque converter.

4,289,046

APPARATUS FOR SYNCHRONIZING SPEED AND ANGULAR POSITION OF POWER DRIVEN MACHINES

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 20, 1979, Ser. No. 68,233
Int. Cl.³ F16H *1/44, 35/06*
U.S. Cl. 74—711 **3 Claims**



1. A mechanism for synchronizing two motor driven apparati both in rotational speed and in angular position relative to each other, comprising, in combination:
(1) a pair of shafts respectively driven in opposite directions by drive trains respectively connected to said apparti, and rotating at equal rotational speeds when rotational speed synchronism of said apparati exists, said shafts being disposed in axially spaced, concentric relationship;
(2) rotationally adjustable means for the controlling the speed of one apparatus;
(3) planetary gearing means disposed between said shafts and interconnecting same and having a rotatable output member movable upon the occurence of any rotational speed difference between the said shafts;
(4) means connecting said rotatable output member to said rotationally adjustable means for adjusting the speed of said one apparatus in a direction to bring the rotational velocity of said one apparatus into rotational synchronism with the other said apparatus;
(5) means for limiting the rotational movement of said rotatable output member to less than 360°, whereby torque is transmitted from one said shaft to the other whenever said rotatable output member reaches the extreme of its rotation in either direction; and
(6) a torque responsive clutch incorporated in one of said drive trains, said clutch being disengagable by any significant torque produced on said one drive train by said planetary gearing means, said clutch being re-engagable only in a selected angular relationship between the said one shaft and its respective motor driven apparatus.

4,289,047

DIFFERENTIAL GEAR POSITIONING MEANS

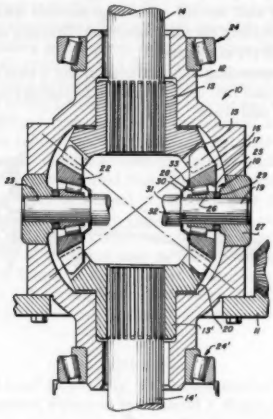
Michael F. Hopkins, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/01010, § 371, Date Nov. 13, 1979, § 102(e), Date Nov. 13, 1979, PCT Pub. No. WO81/01450, PCT Pub. Date May 28, 1981.

This PCT application filed Nov. 13, 1979, Ser. No. 116,744

Int. Cl.[3] F16H *1/40, 1/38*

U.S. Cl. 74—713 9 Claims



1. A differential gear assembly (**10**) comprising:

a driver bevel gear (**13**);

a driven bevel gear (**17**) meshing with said driver bevel gear and defining therewith an acute tooth contact pressure angle relative to the axis of rotation of the driven bevel gear;

a shaft (**19**) coaxial of said axis;

a plurality of tapered roller bearings (**28**) rotatively supporting said driven bevel gear coaxially on said shaft, said roller bearings being disposed at an angle to said shaft axis coordinated with the pressure and pitch angles of said meshing bevel gears such that the axial thrust of said roller bearings on said shaft is less than the thrust parallel to said shaft axis developed by the meshing level gears; and

spring biasing means acting between said driven bevel gear and said shaft for maintaining said driven gear in contact with said tapered roller bearings in the absence of driving force from said driver gear acting on said driven gear.

4,289,048

LOCK-UP SYSTEM FOR TORQUE CONVERTER

Steve A. Mikel, and Alfred P. Blomquist, both of Farmington Hills, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 11, 1978, Ser. No. 940,934

Int. Cl.[3] F16H *3/44;* F16D *33/00, 35/00*

U.S. Cl. 74—733 9 Claims

1. A lock-up system for a hydrokinetic torque converter assembly of a multiple gear ratio automatic transmission for a vehicle, said torque converter assembly being of the type including an annular front cover member rotatively drivingly engageable with a prime mover, impeller means carried for rotation with the cover member, and turbine means fluidly connected in driving relationship with the impeller means and drivingly engaged with the input shaft of the multiple gear ratio transmission, said lock-up system comprising:

A. means defining a hub portion of said turbine means including diametral surface extending axially therefrom toward said front cover member;

B. a piston member having a bore slidingly received on said diametral surface for axial movement therealong and defining a first fluid chamber adjacent said cover member and a second fluid chamber adjacent said turbine means;

C. means defining a radially extending forwardly facing flat annular surface proximate the outer periphery of said piston member;

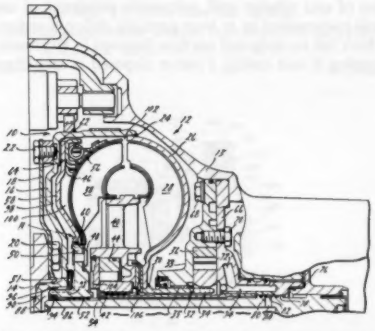
D. sliding seal means carried by said piston member for engagement with said diametral surface and including:

1. means defining an annular groove in said piston bore for receiving said seal member, said groove having an outer diametral surface tapered outward from said hub portion diametral surface in the direction of said front cover member;

2. an elastomeric sealing member of circular cross section carried in said groove; and

3. an antifriction back-up disc carried in said groove adjacent said sealing member;

E. torque isolation means for drivingly interconnecting said piston member and said turbine means;



F. a friction disc member carried by said cover member in juxtaposition with said piston member flat annular surface whereby movement of said piston member from a free position wherein said friction disc is spaced from said annular surface to a locking position wherein said friction disc lockingly engages said annular surface effects mechanical interlocking of said cover member and said input shaft; and

G. fluid control means for circulating fluid to and from said chambers and for switching the pressure differential between said first and second chambers between;

1. an unlocked condition wherein the fluid pressure in said first chamber exceeds the fluid pressure in said second chamber thereby positioning said piston member in said free position; and

2. a locked condition wherein the fluid pressure in said second chamber exceeds the fluid pressure in said first chamber thereby urging said piston member to said locking position.

4,289,049

BOLT HOLDING MACHINE WRENCH

Edward J. Rebish, Euclid, Ohio, assignor to The Lamson & Sessions Co., Cleveland, Ohio

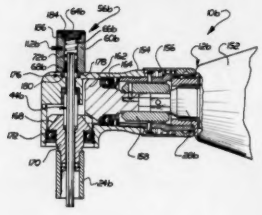
Filed Oct. 1, 1979, Ser. No. 80,196

Int. Cl.[3] B25B *17/00*

U.S. Cl. 81—56 17 Claims

1. A power tool for use in tightening a connection between internally and externally threaded fastener elements, said power tool comprising a casing, a motor disposed within said casing, said motor including a rotatable drive member, a rotatable socket drive element connected with said rotatable drive member in said motor and adapted to be connected with a socket which engages the internally threaded fastener element, said socket drive element having a central passage extending therethrough, a retainer rod extending through the central

passage in said socket drive element, said retainer rod having a first end portion which projects axially outwardly from said socket drive element and is connectable with the externally threaded fastener element to hold the externally threaded fastener element against rotation during rotation of the internally threaded fastener element by the socket and a second end portion which extends through an opening in said casing, and means for holding said retainer rod against rotation with said socket drive member and for applying an axially directed force to said retainer rod to urge said retainer rod toward said externally threaded fastener element, said means for holding said retainer rod against rotation and for applying an axially directed force to said retainer rod including a tubular wall having first and second open end portions, first connector means for releasably connecting the first end portion of said tubular wall to said casing with the opening in said casing aligned with the opening in the first end portion of said tubular wall, a cover member, second connector means for releasably connecting said cover member with said tubular wall with said cover member extending across the opening in the second end portion of said tubular wall, said cover member and said tubular wall cooperating to at least partially define a piston chamber which has an open end portion disposed in alignment with the opening in said casing, a piston disposed in said chamber, said



piston having an outer side surface which is disposed in sliding engagement with an inner side surface of said tubular wall, said piston being movable in said chamber between an initial position in which said piston is disposed adjacent to said first end portion of said tubular wall and a retracted position in which said piston is spaced from said first end portion of said tubular wall, means for connecting said retainer rod with said piston, and spring means for urging said piston toward the initial position, said piston being movable against the urging of said spring means from the initial position toward the retracted position under the influence of force transmitted to said retainer rod from the externally threaded fastener element during tightening of the connection between the internally and externally threaded fastener elements, said first connector means being releasable to enable said tubular wall, piston, retainer member and spring means to be removed from said power tool, said second connector means being releasable to enable said cover member to be disconnected from said tubular wall and connected with said casing to block the opening in said casing upon removal of said tubular wall, piston, retainer member and spring means from said power tool, said second connector means including means for connecting said cover member with said casing to hold said cover member across the opening in said casing after removal of said tubular wall, piston, retainer member and spring means.

4,289,050

EXPANSION TOOL

Vincent J. Scafaro, 4715 W. Laurel La., Glendale, Ariz. 85304

Filed Jun. 29, 1979, Ser. No. 53,256
Int. Cl.[3] B25B *7/02*
U.S. Cl. 81—311 **7 Claims**

1. An expansion tool for spreading the side walls of a longitudinal track member, said track member having a base and first and second side walls extending therefrom comprising:

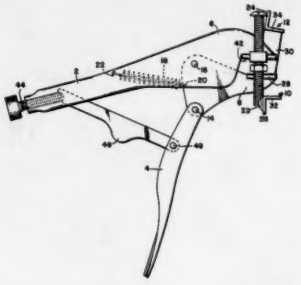
a first member having a first handle portion and a first jaw portion;

a second member having a second handle portion and a second jaw portion;

means coupling said first and second members at points intermediate thereof for moving said second jaw portion towards said first jaw portion when said first and second handle portions are compressed;

first and second spreading members coupled to said first and second jaw portions respectively, said second jaw portion forcing said second spreading member away from said first spreading member when said first and second handle portions are compressed;

said first spreading member comprising a base member coupled to said first jaw portion for engaging transversely the base of said track;



said first spreading member further comprising a first contact member coupled to said base member and extending substantialiy perpendicularly therefrom for engaging one of said first and second side walls;

said first spreading member further comprising a first overhang member coupled to an edge of said first contact member opposite said base member, said first overhang member extending substantially perpendicularly from said first contact member and in a direction away from said base member;

said second spreading member comprising a second contact member for engaging the other of said first and second side walls; and

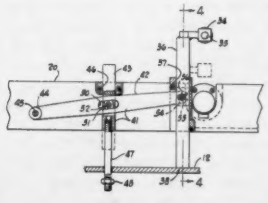
adjusting means for coupling said second contact member to said second jaw portion and capable of altering the position of said second contact member with respect to said second jaw portion.

4,289,051

OBJECT CENTERING AND MOVING MECHANISM

Valdas S. Ramunas, Euclid, Ohio, assignor to Acme-Cleveland Corporation, Highland Heights, Ohio

Filed May 23, 1979, Ser. No. 41,696
Int. Cl.[3] B23B *13/02, 25/06*
U.S. Cl. 82—45 **21 Claims**



1. An object centering and moving mechanism for round or

hexagonal objects having a center line and a finite range of sizes comprising, in combination,

a fixed frame,

a movable frame movable in a first path on said fixed frame,

first caliper means on said movable frame to engage one side of any said object,

second caliper means complementarily cooperable with said first caliper means to engage the opposite side of the object and capable of being spaced from said first caliper means a distance sufficient to accept said finite range of sizes of objects,

support means including said first and second caliper means to support any said object on said movable frame,

means including said support means to locate the center line of any said object in said first path,

a linkage acting between said first and second caliper means,

stop means acting between said fixed frame and said linkage,

and said linkage including a 2:1 mechanical advantage of twice the relative motion between said first and second caliper means compared with the relative motion between said stop means and said fixed frame, whereby said movable frame may be moved in said first path to move any said object and to move said linkage to a point whereat said first and second caliper means engage any said object prior to or at the same time as the stop means engaging said fixed frame to establish the center line of any said object at a fixed reference point along said first path regardless of the diameter of said object.

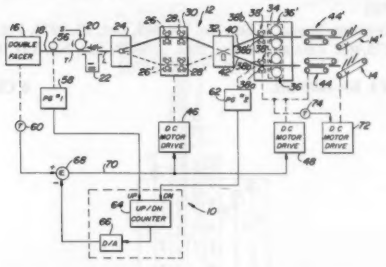
4,289,052
WEB GAP CONTROL FOR CORRUGATOR

A. Brent Woolston, Palmyra, and Donald J. Evans, Cherry Hill, both of N.J., assignors to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Oct. 5, 1979, Ser. No. 82,268

Int. Cl.³ B26D *7/06, 7/32;* **B65H** *29/66*

U.S. Cl. 83—26 **15 Claims**



1. A method of imbricating box blanks delivered successively onto a stacker conveyor in a corrugator, wherein a moving web is severed into leading and trailing portions and the box blanks are cut from the leading and trailing web portions, so that the box blanks cut from the trailing portion of the severed web do not disturb those cut from the leading portion of the severed web on the stacker conveyor, comprising:

driving the stacker conveyor continuously,

monitoring the size of the gap between the leading and trailing severed web portions as the portions move through the corrugator, and

controlling the speed of the leading portion of the severed web to prevent the gap from exceeding an upper limit beyond which the first blank cut from the trailing portion of the severed web disturbs the last blank cut from the leading portion of the severed web on the stacker conveyor.

7. A method of imbricating box blanks delivered successively onto a stacker conveyor in a corrugator, wherein a moving web is severed into leading and trailing portions and the box blanks are cut from the leading and trailing web portions, so that the box blanks cut from the trailing portion of the severed web do not disturb those cut from the leading portion of the severed web on the stacker conveyor, comprising:

automatically monitoring the size of the gap between the leading and trailing severed web portions as the portions move through the corrugator,

stopping the stacker conveyor when said gap reaches an upper limit beyond which a first blank cut from the trailing web portion disturbs a second blank cut from the leading web portion at the stacker conveyor, and

re-starting the stacker conveyor when the gap size falls below said upper limit without closing said gap.

4,289,053
DEVIATION DETECTING APPARATUS FOR A BANDSAW BLADE FOR HORIZONTAL BANDSAW MACHINES

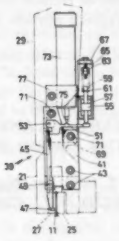
Mitsuyoshi Sawamura, Kobe, Japan, assignor to Amada Company, Limited, Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,501

Claims priority, application Japan, Sep. 16, 1978, 53-112896

Int. Cl.³ B23D *53/00, 59/00*

U.S. Cl. 83—62.1 **4 Claims**



1. A deviation detecting apparatus for a bandsaw blade in a bandsaw machine comprising: arm means pivotally mounted at a location adjacent to the linear path of travel of the blade through the cutting zone; biasing means consisting of a spring-loaded axially movable rod yieldably urging said arm means into slidable contact with one side of said blade, said arm means thus being pivotally movable in response to lateral deviations of said blade from said path; and control means responsive to pivotal movement of said arm means for generating a control signal indicative of said blade deviation.

4,289,054
CIRCULAR SAW WITH MEANS FOR OPENING UP THE CUT SLIT

Paul Pieper, and Walter Cordier, both of Menden, Fed. Rep. of Germany, assignors to Rolf Peddinghaus, Ennepetal, Fed. Rep. of Germany

Filed Aug. 30, 1979, Ser. No. 71,282

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1978, 2838656

Int. Cl.³ B23D *45/04*

U.S. Cl. 83—113 **12 Claims**

1. An improved cutting tool arrangement for cutting a workpiece comprising:

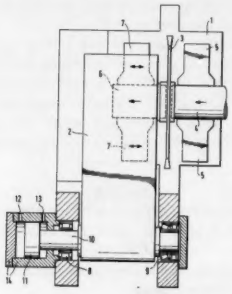
a movable saw blade,

drive means for moving said saw blade,

arm means for supporting said saw blade and said drive means and for effecting transverse movement of the saw blade relative to the workpiece to cut the workpiece into two portions and for effecting retraction of the saw blade relative to the workpiece,

means for effecting movement of one of said workpiece portions away from the other workpiece portion,

displacement means for displacing said arm means laterally of said transverse movement and for moving said saw blade away from the other workpiece portion, and



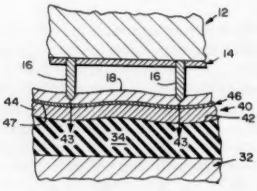
sequencing means for activating said displacement means after said one portion has moved away from said other portion, whereby said arm means are displaced before said saw blade is retracted to reduce contact of said saw blade with the other workpiece portion during retraction.

4,289,055

ROTARY DIE ANVIL

Don F. Von Schriltz, 1747 Pomeroy St., Santa Clara, Calif. 95051

Filed Jan. 7, 1980, Ser. No. 110,118
Int. Cl.[3] B23D *25/12*; B26D *1/40*
U.S. Cl. 83—659 **6 Claims**



1. In a cylindrical anvil of the type useful with a rotatable die cylinder having a die board with cutting means thereupon, said anvil being rotatably mounted and spaced from said die cylinder, an improvement comprising:

an axially extending cylindrical core;

a compressible first layer being bonded to said core concentrically about and axially extending substantially the entire length of said core;

a hard second layer being bonded to said first layer concentrically about and axially extending along substantially the entire length of said first layer; and,

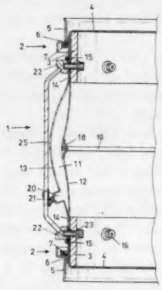
a hard third layer concentrically disposed about and axially extending along substantially the entire length of said second layer, said second and third layers being of different hardnesses with said third layer being the harder and having a Rockwell C hardness of at least about 60, said third layer being coated upon said second layer, said second and third layers together being of sufficient construction to be radially inwardly deflectable responsive to forces imposed by said cutting means of die board, said first layer having a bulk compliance sufficient to permit the deflection of said second and third layers.

4,289,056

PERCUSSION KIT

Stephen F. Shier, 18 Cressy Ave., Windsor Gardens, Australia (5087)

Filed Sep. 25, 1979, Ser. No. 78,750
Claims priority, application Australia, Sep. 28, 1978, PD6148
Int. Cl.[3] G10D *13/02*
U.S. Cl. 84—412 **4 Claims**



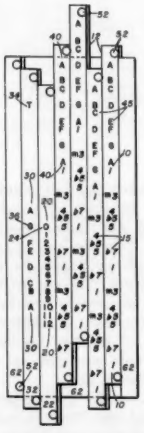
1. A percussion instrument having an upper playing surface supported by an upper ring, a lower ring, and a wall interconnecting said rings, characterized in that said wall comprises a flexible inflatable wall, and means to admit air to said inflatable wall to pressurize the wall for erection, and release said air for said wall to collapse to move said rings toward each other for transport and storage.

4,289,057

PATTERN COMPOSER FOR FINGERBOARD INSTRUMENT INSTRUCTION

Robert R. Whitlock, 2227 Charleston Pl., Hyattsville, Md. 20783

Continuation-in-part of Ser. No. 734,885, Oct. 22, 1976, Pat. No. 4,175,468. This application Dec. 7, 1979, Ser. No. 101,185
Int. Cl.[3] G09B *15/02*
U.S. Cl. 84—485 SR **8 Claims**



1. An apparatus for composing patterns of allowable locations for fingering a musical stringed fingerboard instrument to sound musical tones, comprising:

a plurality of first bases, a plurality of substantially parallel and substantially adjacent first series of at least one type of first indicia on said first bases, each said first series extend-

ing in substantially a single dimension representing the direction of extension of the strings of said stringed fingerboard instrument, each said series representing at least one course of said stringed fingerboard instrument and having a single course coordinate, string stop coordinates along said single dimension representing string stops along said course characteristic of musical intervals used in fingering said stringed fingerboard instrument, the direction of increasing said string stop coordinates representing the direction of increasing musical pitch on the stringed fingerboard instrument, said first indicia of each said first series being located at coordinates of said single dimension, said coordinates in said single dimension of said first indicia forming a mapping image of allowable locations for fingering said course of said stringed fingerboard instrument to sound certain musical tones within the chromatic scale, said first series being repositionable with respect to each other in a direction substantially along said single dimension, string stop coordinates of said single dimension of each of said substantially adjacent series having such spacings as to substantially align in said various repositionings with string stop coordinates of remaining said series of said plurality of first series;

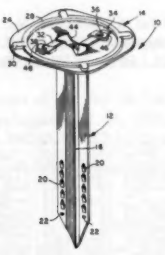
whereby patterns for a plurality of courses may be composed by aligning said string stop coordinates of said plurality of series in accordance with the desired tuning.

4,289,058

SHEET METAL NAIL

Joseph H. Paskert, Lakewood, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 25, 1979, Ser. No. 6,409
Int. Cl.³ E01B *9/12*; F16B *15/06*
U.S. Cl. 411—451 **21 Claims**



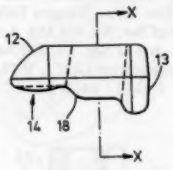
1. A sheet metal nail assembly comprising a one-piece shank portion manually self-retainingly assembleable to a generally flat one-piece head portion, said shank portion and said head portion each defining engaging means adapted to be non-threadably self-retainingly interengaged upon a fractional turn rotation of said shank portion relative to said head portion, the engaging means defined by said shank portion comprising a pair of generally coplanar wing members extending in opposite directions from said shank portion, and the engaging means defined by said head portion comprising a pair of generally coplanar tabs extending in opposite directions generally parallel with and spaced from a surface of said head portion, said tabs spaced from said surface by a distance generally equal to or less than the thickness of said wing members, each of said wing members adapted to be received between said surface and one of said tabs, one of each of said wing members and each of said tabs having a projection extending therefrom and the other of each of said wing members and each of said tabs having an aperture formed therein adapted to receive one of said projections, said projections spaced apart by a distance substantially equal to the distance separating said apertures.

4,289,059

HOOK BOLT ADAPTER

Gordon H. S. Alderton, Bingley, England, assignor to Henry Lindsay Limited, Shipley, England

Filed Jul. 16, 1979, Ser. No. 57,755
Claims priority, application United Kingdom, Jul. 24, 1978, 30901/78; Oct. 16, 1978, 40654/78
Int. Cl.³ F16B *43/02*
U.S. Cl. 411—531 **9 Claims**



1. An adapter for use with a bolt in order to convert the latter into a hookbolt by cooperating with a head of the bolt, the adapter defining a passage through which the stem of the bolt can be taken, in which the adapter comprises:

a nose portion which projects laterally of the passage to form a hook for the bolt in use of the adapter;

an engagement surface provided on the nose portion which extends away from the stem of the bolt and which faces in the direction from the head of the bolt and along the stem of the bolt to engage the surface of a flange to which the bolt is to be hooked in use, the engagement surface being curved with a centre or centres of curvature spaced from said surface in a direction opposite to said first mentioned direction;

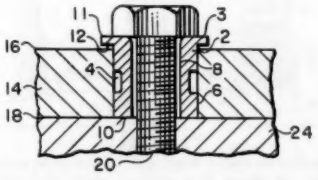
and ribs provided on said engagement surface and extending parallel to each other away from the stem of the bolt, said ribs being made to be deformable so that the engagement surface as a whole can adjust its surface shape to correspond with any irregularities which may be present in the surface of the flange which it engages in use.

4,289,060

DEVICE AND ASSEMBLY FOR MOUNTING PARTS

John E. Emmett, Farmington Hills, Mich., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 898,555, Apr. 21, 1978, which is a continuation-in-part of Ser. No. 839,046, Nov. 3, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 80,613
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—34 **20 Claims**



1. A tubular insert adapted for use in mounting a part onto a base member, said insert having a hollow inner core for receiving a fastener, said insert having a flange on one end for engaging a fastener, and said insert further having at least one annular groove formed around the external cylindrical surface thereof to permit said insert to collapse uniformly in an axial direction responsive to a compressive force exerted in an axial direction against the end of said insert and said insert having a sufficient wall thickness at said groove that the wall yields at said groove when the fastener develops the desired compres-

sive force, whereby a substantial portion of said compressive force is absorbed by said insert and whereby the insert functions without being dependent on exerting lateral forces on an external surface due to lateral motion of the external surface of said insert.

4,289,061

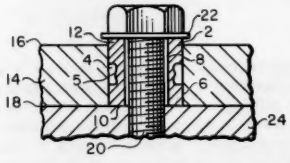
DEVICE AND ASSEMBLY FOR MOUNTING PARTS

John E. Emmett, Farmington Hills, Mich., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 898,555, Apr. 21, 1978, which is a continuation-in-part of Ser. No. 839,046, Nov. 3, 1977, abandoned. This application Oct. 1, 1979, Ser. No. 80,614

Int. Cl.³ F16B *13/06*

U.S. Cl. 411—34 **24 Claims**



1. A tubular insert adapted for use in mounting a part onto a base member, said insert having a hollow inner core for receiving a fastener and further having at least one annular groove formed around the external cylindrical surface thereof to permit said insert to collapse uniformly in an axial direction responsive to a compressive force exerted in an axial direction against the end of said insert and said insert having a sufficient wall thickness at said groove that the wall yields at said groove when the fastener develops the desired compressive force, whereby a substantial portion of said compressive force is absorbed by said insert and whereby the insert functions without being dependent on exerting lateral forces on an external surface due to lateral motion of the external surface of said insert.

4,289,062

EXPANSION DOWEL

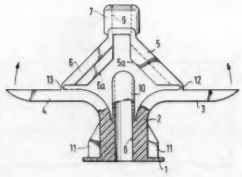
Erwin Schiefer, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Apr. 27, 1979, Ser. No. 34,147

Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819862

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—34 **6 Claims**



1. Expansion dowel for insertion into an opening in a receiving member, such as a plate, wall, hollow block or similar structural member having a hollow space inwardly of the surface through which the dowel is inserted, the dowel has a leading end which is inserted first through the opening so that at least a portion of the dowel extending from the leading end extends into the hollow space, and a trailing end, the dowel comprises an axially extending tubular shaft portion extending from the trailing end toward the leading end, a flange portion located at and extending transversely of and outwardly from said shaft portion at the trailing end, said shaft portion having a bore extending axially therethrough, a pair of flexible expansion arms connected to said shaft portion, a pair of webs with each said web connected to a different one of said expansion arms and said webs being interconnected, the dowel has an inserting position with the expansion arms and webs extending in the axial direction of said shaft portion and located closely together, and an expansion position with each said expansion arm and said web connected to it extending transversely outwardly from the axis of said shaft portion, wherein the improvement comprises that said expansion arms have a first end connected to said shaft portion at a location spaced from the trailing end of the dowel and a free second end spaced longitudinally from the first end in the axial direction of said shaft portion when the dowel is in the inserting position, said webs each have a first end and a second end spaced longitudinally apart with the first end flexibly connected to the associated said expansion arm and the second end connected to the second end of the other said web, in the inserting position said expansion arms and webs extend in generally paraallel relation along the axis of said shaft portion and in the expansion position said webs extend at an acute angle to the portion of the associated said expansion arm extending between the first end of said expansion arm and the junction of said web and the associated said expansion arm, the portion of said expansion arm extending from the junction with said web to the second end thereof extends approximately perpendicularly to the axis of said shaft portion, and the first end of each said web having a reduced thickness portion connected to the associated said expansion arm at a location approximately mid-way between the first and second ends of said expansion arm with the reduced thickness portion forming the flexible connection between said web and said expansion arm.

4,289,063

HYDRAULIC DRIVING DEVICE

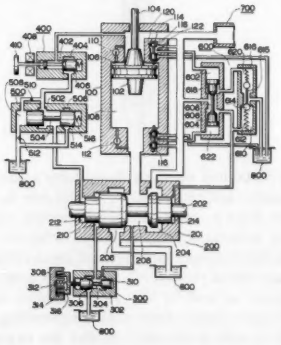
Ichiro Nakamura, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1978, Ser. No. 922,359

Claims priority, application Japan, Jul. 20, 1977, 52-86011

Int. Cl.³ F01L *25/02;* **F15B** *13/042*

U.S. Cl. 91—306 **7 Claims**



1. A hydraulic driving device comprising:

a cylinder;

a piston which slides within said cylinder;

a main control valve which includes a valve body and a spool sliding within said valve body and which is formed between said valve body and said spool with a first oil chamber communicating with a high oil pressure source, a second oil chamber communicating with a low oil pressure source and a third oil chamber communicating with either of said first and second oil chambers and a chamber in said cylinder, said chamber in said cylinder communicating with either of said first oil chamber and said second

oil chamber through said third oil chamber in correspondence with a position of said spool driven by oil pressure changes within the respective oil chambers;

characterized in that said main control valve is further formed with a fourth oil chamber, a fifth oil chamber and a sixth oil chamber, and said spool is provided with first surfaces upon which oil pressures in said fourth and fifth oil chambers act in a first direction connecting said first oil chamber and said chamber in said cylinder when these fourth and fifth oil chambers communicate with said high oil pressure source and second surfaces upon which oil pressures in said first and sixth oil chambers act in a second direction connecting said second oil chamber and said chamber in said cylinder; and

said hydraulic driving device further comprising:

a first valve and first signal producing means for impressing a first signal to actuate said first valve, said first valve communicating said third oil chamber and said fourth oil chamber while said first signal is not impressed and communicating said fourth oil chamber and said low oil pressure source when said first signal is impressed, and

a valve arrangement, having at least a second valve, and second signal producing means for impressing a second signal to actuate said second valve, said valve arrangement communicating said fifth oil chamber and said high oil pressure source while said second signal is impressed and communicating said fifth oil chamber and said low oil pressure source when said second signal is released,

wherein said main control valve, first valve and valve arrangement includes means for enabling said spool to complete a movement in said first or second direction for opening or closing said communication between said chamber in said cylinder and said first or second chamber in response to said first or second signal even if said first or second signal is terminated after a short interval and prior to completion of said movement.

4,289,064

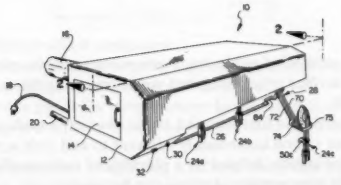
AUTOMATED COOKER

Stephen L. Rosenblatt, 2500 Haven La., Salt Lake City, Utah 84117

Continuation-in-part of Ser. No. 34,219, Apr. 30, 1979, abandoned. This application Jul. 24, 1980, Ser. No. 171,637

Int. Cl.³ A47J *37/04*

U.S. Cl. 99—334 **20 Claims**



1. An automated cooker for sandwiches and the like, said cooker comprising:

heating means for cooking said sandwiches as they pass therethrough;

one or more sandwich holders for individually carrying each sandwich, each holder comprising handle means and means for enclosing the sandwich to be cooked;

conveyor means for transporting said sandwich holders through said heating means;

a motor for driving said conveyor means;

a switch for turning on said motor; and

means for triggering said switch, said triggering means being placed such that it will be activated by the handle means of any sandwich holder attached to said conveyor means.

4,289,065

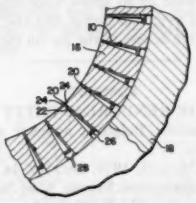
SPACERS FOR CAGE PRESSES

John P. Krebser, Piqua, Ohio, assignor to The French Oil Mill Machinery Company, Piqua, Ohio

Filed Mar. 21, 1980, Ser. No. 132,707

Int. Cl.³ B30B *9/06*

U.S. Cl. 100—129 **4 Claims**



1. Spacers for use in a cylindrical cage of a continuous screw press having axially extending and radially spaced screen bars, said spacers being positioned between said radially spaced screen bars at uniformly spaced locations axially along said cylindrical cage, each said spacer being formed of a single L-shaped piece of sheet material the thickness of which is substantially the desired minimum spacing between adjacent said screen bars, each said spacer being positioned between adjacent screen bars so that a leg portion of said spacer extends substantially radially inward to a position adjacent innermost edge portions of said screen bars, and a foot portion of said spacer extends substantially tangentially between adjacent screen bars and in engagement therewith, all of said spacers being secured to an associated screen bar by an adjacent leg portion.

4,289,066

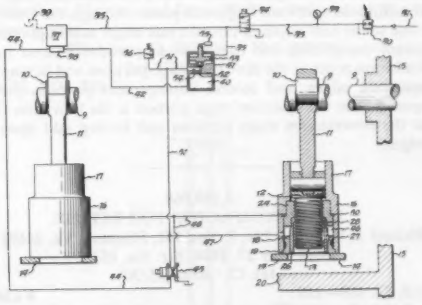
HYDRAULIC POSITION CONTROL FOR MECHANICAL POWER PRESS SLIDES

Norbert J. Proga, Eastlake, Ohio, assignor to Niagara Machine & Tool Works, Buffalo, N.Y.

Filed May 5, 1980, Ser. No. 146,651

Int. Cl.³ B30B *1/26*

U.S. Cl. 100—53 **3 Claims**



1. A power press comprising frame means including a bed, a reciprocable slide supported by said frame for movement toward and away from said bed, drive means for reciprocating said slide including connecting rod means, overload responsive slide shut height adjusting means acting between said slide and said connecting rod means, said adjusting means including a cylinder on said slide means and a piston slidable therein and pivotally connected with said connecting rod, said piston having threaded connection with a portion of said cylinder for shut height adjustment, an hydraulic withdrawal and overload piston in said slide connected cylinder, a worm wheel at the base of each of said slide means cylinders, an annular hydraulic

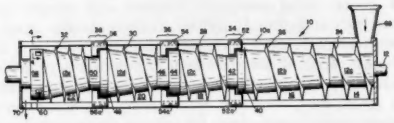
chamber between the top of each worm wheel and the lower end of each overload piston, and a second hydraulic chamber between an upwardly facing portion of each overload piston and said slide connected cylinder, and valve means alternatively operable to apply hydraulic fluid under predetermined pressure to said first hydraulic cylinder to transmit force from said overload piston to said worm wheel to effect working strokes of of said slide or to apply hydraulic pressure to the space between said overload piston and said slide cylinder to raise the latter to give access to the die on the bed of the press.

4,289,067

PRESS FOR RENDERING FATTY BONES

Gyula Hanak, Brussels, Belgium, assignor to PB Gelatines, Brussels, Belgium

Filed May 31, 1979, Ser. No. 44,284
Claims priority, application France, May 31, 1978, 78 16163
Int. Cl.[3] B30B *9/12*
U.S. Cl. 100—117 **12 Claims**



1. In a multistage continuous rotary press assembly, including a cylindrically shaped casing and including a rotary drive arbor passing therethrough and supported at the ends thereof and carrying a continuous screw collar in each stage with the outer diameter of the screw collar in each stage being slightly less than the inside diameter of the casing, and with the inner diameter of the screw collar in each stage increasing in the direction of feeding circulation of the product material being treated, said press assembly further comprising: said screw collar having a shape to define transition zones between adjacent pair of stages in the area between the end of the screw collar in an upstream stage portion and the beginning of the screw collar in the next succeeding downstream stage portion; material impingement means disposed within each transition zone, said material impingement means having upstream edges oriented for dividing material entering the transition zone from the adjacent upstream stage as it passes through the transition zone to the next adjacent downstream stage, said impingement means comprising first impingement portions located in the transition zones at the upstream stage portions and having said upstream edges, and second impingement portions located spaced from the upstream stage portion in the transition zones at the downstream stage portions and having said upstream edges.

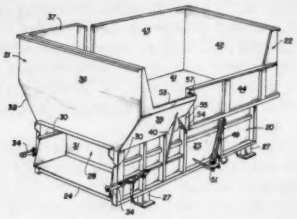
4,289,068

DUMP COMPACTOR FOR REFUSE

Richard J. Heinrich, Rte. 3, Box 452, Staunton, Va. 24401

Filed May 27, 1980, Ser. No. 153,423
Int. Cl.[3] B30B *15/30*
U.S. Cl. 100—215 **8 Claims**

1. A refuse receiving and compacting apparatus comprising in combination a horizontal axis ram-type compactor unit forming a base for the apparatus, said compactor unit having a discharge end adapted for coupling releasably to a refuse transport receptacle, a hopper bin fixed on top of the compactor unit near said discharge end and having a bottom outlet opening in registration with a top opening of the compactor unit forwardly of the ram of the compactor unit, the hopper bin being open at its top and rear and including front and side walls, a coacting dumping bin mounted on top of said compactor unit rearwardly of the hopper bin and in tandem relation thereto, the dumping bin being open at its top and front and having bottom, side and rear walls, means hingedly connecting the forward end of the dumping bin to the compactor unit, and power means coupled between the dumping bin and compactor unit to raise and lower the dumping bin around the axis of the first-named means, the side walls of said hopper bin and dumping bin being constructed and arranged for scissoring



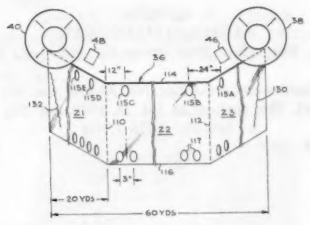
action without interference during the raising and lowering of the dumping bin, and the side walls of the hopper bin and dumping bin along one side of the apparatus being of reduced height compared to the opposite side walls and the front and rear walls of the two bins to promote side loading of the apparatus when the dumping bin is in a level position.

4,289,069

METHOD FOR PRODUCING A MULTIPLE COLOR HARD COPY IMAGE

Raymond F. Melissa; Lorne H. Grummett, both of Costa Mesa, and Joseph J. Fischer, Santa Ana, all of Calif., assignors to Trilog, Inc., Irvine, Calif.

Filed Apr. 18, 1979, Ser. No. 31,076
Int. Cl.[3] B41J *7/70*
U.S. Cl. 101—93.01 **5 Claims**



1. A method of producing a composite multiple color image on the surface of an elongated web comprising the successive steps of:

positioning a first selected color zone of a multiple color zone ribbon immediately adjacent to said web surface in a print station defined by a plurality of individually actuatable substantially identical dot hammers;

selectively impacting said dot hammers against said web surface and ribbon in said print station with a first multitude of successive impacts to print substantially identically shaped dots on said web surface with the color of said first selected color zone, said dots spaced sufficiently closely so as to partially overlap one another;

repositioning said ribbon to position a second selected color zone of said ribbon in said print station;

selectively impacting said dot hammers against said web surface and ribbon in said print station to print substantially identically shaped dots on said web surface with the color of said second selected color zone, at least some of said dots printed with the color of said second selected color zone overlaying some of said dots printed with the color of said first selected color zone;

repositioning said ribbon to position a third selected color zone of said ribbon in said print station;

selectively impacting said dot hammers against said web surface and ribbon in said print station to print substantially identically shaped dots on said web surface with the color of the third selected color zone, at least some of said dots printed with said third selected color zone overlaying some of said dots printed with the color of said first or second selected color zones; and

incrementally moving said web in a first direction past said print station after at least one of said first multitude of successive impacts to thus create a two dimensional dot pattern in said first color on said web surface; and

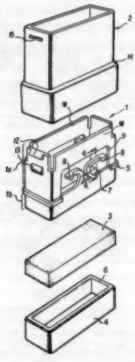
moving said web in a second direction opposite to said first direction prior to said step of impacting to print said web surface with the color of said second selected color zone.

4,289,070

RUBBER STAMP

Francis W. MacGregor, New Britain, Conn., assignor to Cosco Industries, Inc., New Britain, Conn.

Filed Jun. 26, 1979, Ser. No. 52,449
Int. Cl.³ B41K *1/42*
U.S. Cl. 101—327 **12 Claims**



1. A stamp which comprises:

an inner member comprising a generally tubular body having a ridge thereon above its lower end;

an inkable pad in the inner member having an indicia-bearing portion extending below the lower end of the inner member;

a sleeve member comprising a tubular body carried on the inner member in telescoping relationship therewith and having a flange engageable with the ridge, the sleeve member being movable with respect to the inner member between a lowered position where its flange engages the ridge on the inner member and its lower end extends beneath the indicia-bearing portion of the inkable pad and a raised position where its lower end is substantially level with the indicia-bearing portion for exposing said portion; and

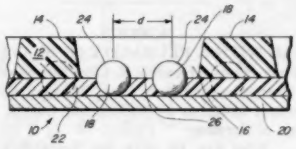
means for biasing the sleeve member to its lowered position comprising a resilient finger integral with the inner member, disposed in an aperture in a side wall of the inner member, and extending generally in the plane of the wall, the finger having a projection at the end thereof extending laterally outwardly toward the sleeve member and being engageable with the flange on the sleeve member.

4,289,071

SHALLOW RELIEF NON-BOTTOMING PHOTOPOLYMER PRINTING PLATE

Robert W. Hallman, San Diego; Koichi Kimoto, Oceanside, and Sakuo Okai, Carlsbad, all of Calif., assignors to Napp Systems (USA), Inc., San Marcos, Calif.

Continuation of Ser. No. 863,775, Dec. 23, 1977, abandoned.
This application Sep. 12, 1979, Ser. No. 74,700
Int. Cl.³ B41N *1/06*; B41C *1/00*
U.S. Cl. 101—395 **5 Claims**



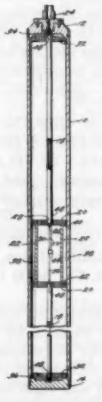
1. A shallow relief, non-bottoming printing plate comprising a water-developable photopolymerized layer having a thickness less than 0.020 inch and supported on a substrate, and a binder layer having a thickness from about 5 to 60 microns and carrying a plurality of dispersed ink repellant, polytetrafluroethylene particles interposed between said substrate and said photopolymerized layer, said binder layer being selected from the group consisting of (a) styrene-butadiene copolymers, (b) polyesters, (c) glyoxal, or mixtures of (a), (b), or (c), with partially hydrolyzed polyvinyl acetate, said photopolymerized layer having raised image areas and recessed background areas, and said dispersed particles being present in said binder layer in a size and concentration sufficient to create an array of protuberances in the background areas having an average height between about 5 to 70 microns and an average distance between protuberances of about 5 to 1000 microns.

4,289,072

EARTH FRACTURING APPARATUS

Thomas A. Edgell, 703 S. College, Apt. #2, Tyler, Tex. 75701; Alfred R. Foote, Winona, Tex., and Charles P. Steele, Hallsville, Tex., assignors to Thomas A. Edgell, Tyler; Roberta K. Tillinghast, Houston and James W. Fair, Tyler, all of, Tex., a part interest

Filed Dec. 13, 1979, Ser. No. 103,109
Int. Cl.³ E21B *43/11*
U.S. Cl. 102—318 **12 Claims**



1. An improved earth fracturing apparatus of the type having an elongated casing containing a laterally directed charge

located at a central portion of said casing and additional explosive devices positioned on opposite sides of said charge, said improvement comprising:

a rod positioned within said casing and extending longitudinally thereof;

means for supporting said rod at one end of the casing;

a plurality of detonating means supported by said rod, said detonating means being spaced along said rod at positions adjacent said additional explosive devices; and

means for actuating said detonating means to set off the additional explosive devices and the laterally directed charge.

4,289,073

WARHEAD WITH A PLURALITY OF SLAVE MISSILES

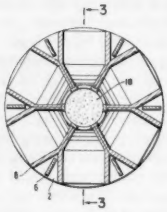
Rudolf Romer, Kaarst; Hendrik R. Lips, Duesseldorf; Benjamin Furch, Unterluess, and Hans Orth, Ratingen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,143

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835817

Int. Cl.³ F42B *13/02*

U.S. Cl. 102—476 **7 Claims**



1. In a warhead having a casing, a plurality of slave missiles containing explosive material disposed in firing tubes mounted in the casing and directed radially thereof, a parachute connected to the warhead and causing a directional, braked descent thereof in the target area, a proximity fuse on the warhead causing the ejection of the slave missiles from the warhead, the improvement wherein the warhead is of disc-shaped construction, the casing of the warhead having a cover plate at each end thereof, each cover plate having an outwardly open depression therein, a central propellant tube in the casing receiving a propellant charge, radial range spacers and radial firing tubes disposed between the cover plates and the radial range spacers, and means connecting the propellant tube to the radially inner ends of the slave missiles whereby the slave missiles are ejected from the warhead upon the firing of the propellant charge in the propellant by the proximity fuse.

4,289,074

CONSTRUCTION OF TRUCK FOR ATTRACTIVE TYPE MAGNETICALLY LEVITATED VEHICLE

Shinji Nakamura, Kawasaki, and Katsuyoshi Yamakawa, Kunitachi, both of Japan, assignors to Japan Air Lines Co., Ltd., Tokyo, Japan

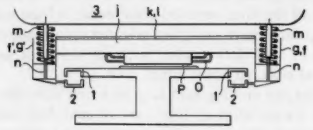
Filed Aug. 11, 1978, Ser. No. 933,038

Claims priority, application Japan, Sep. 22, 1977, 52-114058

Int. Cl.³ B61B *13/08*

U.S. Cl. 104—284 **3 Claims**

1. A truck for an attractive type magnetically levitated vehicle which is to be levitated by the attraction of electromagnets, comprising four electromagnet means positioned at the vertex points of a rectangular plane figure for being opposed to a pair of left and right armature rails laid on the ground, and I-beam type girders having a vertical web and horizontal flanges connecting said electromagnet means and extending along the four sides of said rectangular plane figure, said girders being resistive to bending but being sufficiently twistable for permitting said truck as a whole to twist sufficiently for accommodating movement of the magnets out of



the plane of said rectangular plane figure to maintain the individual magnets in good magnetic relation to said rails, and shock absorber means at the corners of said rectangular plane figure for attaching said truck to the vehicle.

4,289,075

STEERING ARTICULATED CAR

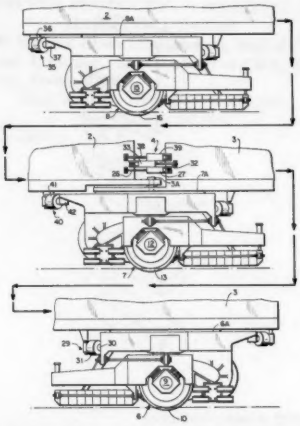
Roy E. Smith, Kingston, Canada, assignor to Urban Transportation Development Corporation Ltd., Toronto, Canada

Filed Jul. 14, 1978, Ser. No. 924,544

Claims priority, application Canada, Jul. 12, 1978, 307239

Int. Cl.³ B61D *3/10;* **B61F** *3/12, 5/44, 5/50*

U.S. Cl. 105—4 R **6 Claims**



1. An articulated railway vehicle comprising first and second pivotally connected body portions, at least three spaced, independently controlled wheel sets supporting said vehicle, each of said wheel sets being attached to said vehicle for pivotal movement about respective substantially vertical, horizontally displaced axial pivots, sensing means for sensing changes in the relative angle between said first and said second body portions, actuating means for effecting pivotal movement of each of said wheel sets, and means connecting said sensing means and said respective actuating means for positioning said wheel sets by said actuating means to a substantially radial alignment when said articulated vehicle travels curved railway track.

6. An articulated truck for a railway vehicle comprising first and second pivotally connected truck portions, said truck having three wheel sets attached to said truck for pivotal movement about respective substantially vertical axial pivots, sensing means for sensing changes in the relative angle between said first and second portions, actuating means for effecting pivotal movement of each of said wheel sets, and means connecting said sensing means and said respective actuating means for positioning said wheel sets by said actuating means

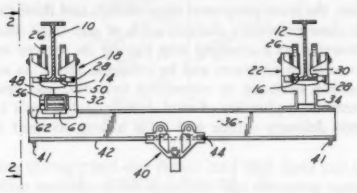
to a substantially radial alignment when said articulated truck travels curved railway track.

4,289,076

SELF ALIGNING CARRIER HEAD AND TRUCK ASSEMBLY

John F. Miller, P.O. Box 277, Howell, Mich. 48843

Filed May 29, 1979, Ser. No. 43,376
Int. Cl.³ B61D *15/00*; B61F *13/00*; B66C *17/04*
U.S. Cl. 105—163 R **9 Claims**



1. A trolley assembly riding a pair of rails comprising in combination:

a first carrier head with a first wheel for riding the first rail of said pair, the first carrier head joined to a load bearing connector upon which a load may be carried;

a second carrier head with a second wheel riding on the second rail of said pair operably joined to the load bearing connector by a non-movable restraining means for restraining longitudinal movement between the load bearing connector and the second carrier head, and said restraining means passing through a stationary recess in the load bearing connector and having a free length greater than the length of the recess to allow unresisted lateral movement relative the carrier head of the load bearing connector along the restraining means; and

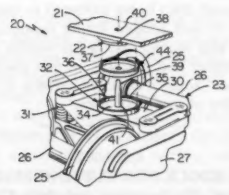
said second carrier head further having separate from the restraining means a connecting support surface on which a lower surface of the load bearing connector rests in continual surface to surface contact.

4,289,077

RAILWAY CENTER BEARING WEAR LINER

Donald L. Kleykamp, Springboro, Ohio, and Homer N. Holden, Sylva, N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed May 24, 1979, Ser. No. 42,256
Int. Cl.³ B61F *5/16*; F16C *17/04, 17/10*
U.S. Cl. 105—199 C **10 Claims**



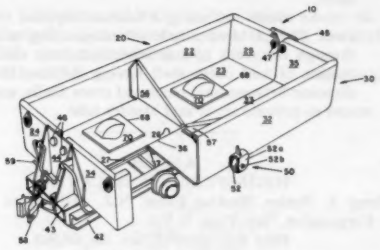
1. In a cup-shaped wear resistant liner for a center plate structure of a railway vehicle defined by a planar disc-like bottom portion adjoined by a tubular peripheral flange portion extending upwardly from the periphery of said bottom portion, each of said portions being made primarily of polymeric material, the improvement wherein one of said portions being made of a material having a particular wear characteristic and the other of said portions being made of a material having a wear characteristic that is different from the wear characteristic of said one portion, said portions being fixed together to define a unitary structure.

4,289,078

TILTING DUMPING BOTTOM SECTION RAILWAY CAR

Robert S. Anderson, Huntington, W. Va., assignor to ACF Industries, Inc., New York, N.Y.

Division of Ser. No. 832,926, Sep. 13, 1977, Pat. No. 4,168,929.
This application Feb. 21, 1979, Ser. No. 12,993
Int. Cl.³ B61D *7/12, 7/32, 9/08, 9/14*
U.S. Cl. 105—241.2 **15 Claims**



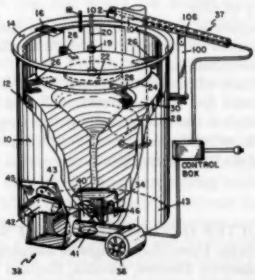
1. An open top, bottom dump railway car comprising: a car body divided longitudinally into at least two transversely spaced car body sections; said car body sections including respective transversely spaced side walls, at least one end wall and bottom walls having inner edges abutting in closed position to define the bottom of the car; said side walls and bottom walls making at least a right angle; each said end wall pivotally mounted on a vertically extending support supported by a rail car underframe; said body sections extending outboard of the wheels; said bottom walls located below the top of said wheels in closed position; well means in said bottom walls to allow said wheels to extend above said bottom walls; the entire volume of said body sections located outboard of said wheels available for lading carrying capacity; each of said body sections pivotable from the closed position to an open position in which the inner edges of said bottom walls are spaced apart to allow discharge of lading.

4,289,079

SAWDUST FURNACE

Gwido K. Swistun, Shadacee Rd., Saco, Me. 04072

Filed Mar. 31, 1980, Ser. No. 136,172
Int. Cl.³ F23G *3/00*
U.S. Cl. 110—255 **6 Claims**



1. An improved sawdust-burning furnace of the type having an inner shell, an outer shell disposed concentrically around said inner shell, further being slightly higher than said inner shell, a bottom member closing said outer shell at the base thereof, a cover member adapted to cover said outer shell and inner shell in which sawdust is packed having a vertical channel and a lower horizontal channel interconnected therewith and an exhaust aperture defined in said outer shell adapted for

interconnection to a flue connector, wherein the improvements comprise:

said cover having an aperture defined in a central portion thereof;

a suspension rod adapted to slidably be inserted through said cover member aperture;

a flame deflector adapted to be interconnected to the base of said suspension rod, said flame deflector including support means adapted to rest upon sawdust placed in said furnace;

air intake means including a firebox disposed inside said inner shell, a bleeder tube interconnecting said firebox through the walls of said inner and outer shells to the outside of said outer shell having air vent means also disposed between said inner and outer shells; and

means to provide air to said bleeder tube.

4,289,080

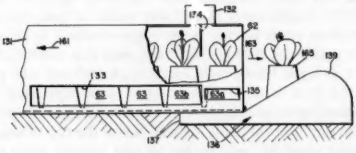
HIGH-SPEED TRANSPLANTER

Percy A. Penley, Basking Ridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 25, 1979, Ser. No. 60,308

Int. Cl.³ A01C *11/02*

U.S. Cl. 111—3 **27 Claims**



1. In a high speed transplanter for transplanting seedlings grown in grow blocks which are arranged on said transplanter as a plurality of files of seedling blocks which contain at least one seedling and of dud blocks which lack a seedling, wherein said transplanter comprises a frame which is rotatively supported by wheels and a block movement means, including a delivery tube, for advancing said plurality of files, longitudinally aligned and disposed end-to-end, rearwardly and downwardly toward a furrow in soil therebeneath, the improvement for replacing each said dud block with a following grow block which is statistically likely to be a seedling block, whereby planting efficiency can be increased by producing a more perfect stand, comprising:

A. a seedling sensing means for sequentially detecting the presence of a seedling in each seedling block of said plurality of files;

B. a signaling means, connected to said seedling sensing means, for indicating a dud block in which said presence is not detected; and

C. a block advancement means for additionally advancing any said file, in which said each dud block is indicated, through a distance equalling the length of at least one block, whereby a selected following block is planted in addition to said dud block.

4,289,081

COULTER DEVICE FOR DIRECT SEED DRILLS

Paul Koronka, Upwaltham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 18, 1978, Ser. No. 970,875

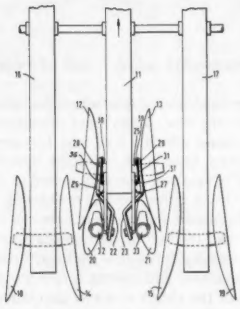
Claims priority, application United Kingdom, Dec. 21, 1977, 53186/77; May 25, 1978, 22433/78

Int. Cl.³ A01C *5/06*

U.S. Cl. 111—88 **7 Claims**

1. A drill comprising:

a plurality of first frame members extending rearwardly with respect to the forward direction of travel of said drill, each of said plurality of first frame members being disposed in a spaced apart, substantially parallel orientation with respect to one another and each having a free end: a plurality of first, rotatable, dished discs for cutting slots into the soil, one pair of each of said first discs being mounted to one of each said first frame members at the respective said free end thereof, said first discs of each of said one pair of first discs being mounted to opposite sides of said free end and having convex surfaces facing each other; a plurality of third, rotatable, dished discs of smaller diameter then said first discs, one rearwardly overlapping each individual one of said first discs and having a concave surface facing the convex surface its associated first disc, the front peripheral edge of each said third disc being in close proximity thereto, each of said third discs being mounted to a cranked arm having its remote end constructed to embrace, and be rotatable about, an axle connection between its respective first disc and first frame member; a plurality of seed delivery tubes each having a seed delivery orifice and each having its seed delivery



orifice disposed vertically above the concave surface a respective third disc and rearwardly of an upright plane containing a respective axle connection between a first disc and first frame member, and a plurality of second frame members extending in a rearward direction and disposed in a spaced apart, substantially parallel orientation with respect to one another and disposed alternately between members of said plurality of first frame members, each of said second frame members having a free end positioned rearwardly of said free ends of said first frame members, and a plurality of second rotatable, dished discs, for intercepting the soil displaced by the said plurality of first discs and to mechanically guide the soil so that it tumbles into the slots cut by said first discs, one pair each of said second discs being mounted to one of each of said free ends of said second frame members, so that each individual said second disc is rearwardly overlapping the closest member said plurality of first discs, having a concave surface facing a concave surface of said member of said plurality of said first discs.

4,289,082

KNIFE BLOCK FOR TUFTING MACHINES

James E. Stoker, Chickamauga, and John C. Powell, Rising Fawn, both of Ga., assignors to Spencer Wright Industries, Inc., Chattanooga, Tenn.

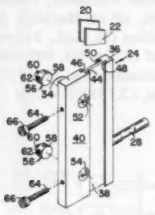
Filed Jan. 11, 1980, Ser. No. 111,359

Int. Cl.³ D05C *15/00*

U.S. Cl. 112—79 R **6 Claims**

1. A knife block for a tufting machine comprising an elongated body member having a pair of longitudinally extending spaced flange portions connected together by a web, a knife receiving channel defined on each side of said web, each channel including a pair of longitudinally extending facing grooves in the flanges adjacent said web, at least one circular bore

extending transversely through one of said flanges and opening onto the grooves disposed in said one flange, a cylindrical clamping member positioned in each bore and having a smaller diameter than said bore, said clamping member having a radial recess intermediate the extremities thereof and opening away from the other of said flanges, and screw means threadedly



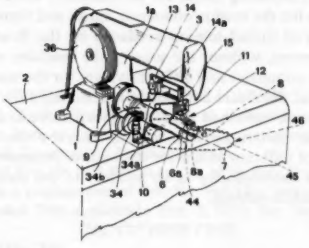
extending through said one flange into each bore and receivable within said recess for engaging said clamping member in said recess and forcing same toward the other flange, said screw member having a smaller cross sectional configuration then the recess for permitting tiltable movement of the clamping member into abuttment with a knife disposed in each of the grooves in said one flange.

4,289,083

AUTOMATIC MACHINE FOR ZIG-ZAG STITCHING OF TUBULAR ELEMENTS

Mario Ciucani, Via dell'Universita, 16-Fermo, Italy

Filed Nov. 27, 1979, Ser. No. 97,705
Claims priority, application Italy, Nov. 30, 1978, 3608 A/78
Int. Cl.[3] D05B *3/04*
U.S. Cl. 112—157 **8 Claims**



2. An automatic machine for zig-zag stitching of tubular elements, which machine is capable of zig-zag stitching trimmings on mocassin-type footwear and capable of fixing transversal reinforcing bands to the vamp of said footwear, said machine comprising:

a base support with a projecting head to support a needle;

a machine cylinder positioned beneath the projecting head, and having a crochet located within, which crochet is capable of coacting with said needle to form stitches in the material being operated on by said machine;

a work plane on which to lay said material being operated on and a pressure foot, both of which are moveable relative to said cylinder; where the pressure foot operates in conjunction with said work plane to grip said material and move said material under said needle in phase with the movement of said needle;

means for moving said work plane and said pressure foot relative to said cylinder;

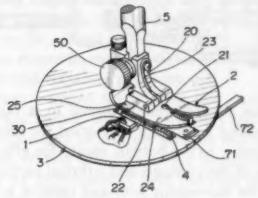
one or more cam means splined on a shaft which is rotated by the machine's motorization means, wherein said one or more cam means are means for controlling the means for moving said work plane and said pressure foot relative to said cylinder.

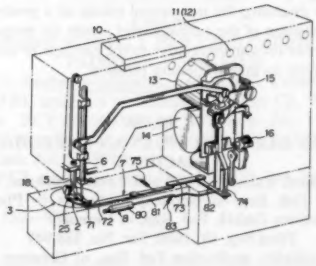
4,289,084

SEWING MACHINE WITH STITCH TYPE IDENTIFYING DEVICE

Hideaki Takenoya, and Yoshinobu Tonomura, both of Hachioji, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1979, Ser. No. 48,434
Claims priority, application Japan, Jun. 15, 1978, 53-71518
Int. Cl.[3] D05B *3/02, 29/00*
U.S. Cl. 112—158 E **14 Claims**





1. In a sewing machine which can produce zigzag stitches using a laterally moving reciprocating needle and a needle plate having an elongated hole into which the needle may be dropped, which can further produce straight stitches using a laterally stationary reciprocating needle and a needle plate having a circular hole into which the needle may be dropped, and which can still further produce embroidery stitches by deactivating a feed dog, and which can accept a plurality of presser feet which are each adapted to a specific stitching application such as zigzag stitching, straight stitching and embroidery stitching, an improvement comprising: a first means attached to the sewing machine and cooperating with the presser foot attached thereto and producing a presser foot signal, the first means operating in a manner that the presser foot signal produced by the first means is determined by the presser foot which is attached to the machine; a lateral control means attached to the machine and cooperating with the needle to control lateral movement thereof in response to a lateral movement controlsignal; a needle plate adjusting means moving a plate bearing a circular hole to and from a position in which the circular hole is centrally located in the elongated hole in response to a needle plate signal; a feed dog means cooperating with the feed dog, the feed dog means activating and deactivating the feed dog in response to a feed dog signal; and a control circuit connected to the first means and responding to the presser foot signal, the control circuit operating in a manner that when a presser foot is attached to the machine, an appropriate lateral movement control signal, an appropriate needle plate signal and an appropriate feed dog signal are generated, whereby lateral needle movement, needle plate hole

shape and feed dog operation are made consistant with the presser foot employed.

4,289,085

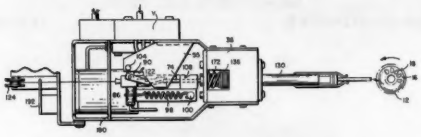
BOBBIN LOADING APPARATUS FOR SEWING MACHINES

Herman Rovin, Rte. 3, Box 370A, Piedmont, S.C. 29673

Filed Sep. 19, 1979, Ser. No. 76,938

Int. Cl.³ D05B *45/00, 65/00*

U.S. Cl. 112—181 **15 Claims**



1. Apparatus for presenting thread to a rapidly rotating bobbin comprising a carriage supported for linear reciprocal movement relative to the bobbin, means for effecting reciprocal movement of the carriage, and a thread carrier mounted on the carriage, for movement with and relative to the carriage, means for withholding forward movement of the thread carrier during a portion of the forward movement of the carriage, means for disabling the last-named means at a predetermined forward position of the carriage, and means for propelling the thread carrier forwardly relative to the carriage to advance the thread carrier to thread loading position.

4,289,086

NEEDLE BAR COUPLING IN AN EMBROIDERING MACHINE

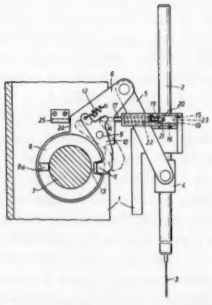
Kurt Bolldorf, Kaiserslautern, and Ernst Brückner, Neuwied, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 19, 1980, Ser. No. 188,947

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1979, 7927287

Int. Cl.³ D05B *55/16*

U.S. Cl. 112—221 **4 Claims**



1. A needle bar coupling in an embroidering machine having a plurality of needle bars driven by a crank operated by a drive shaft, comprising coupling connected to the needle bar and connected to said drive shaft being rotatable by said drive shaft to move said needle bar, a coupling connected between said crank and said drive shaft fixed to said drive shaft for rotation therewith and having a drive groove, a pawl pivoted on said crank and having a tooth engageable in said drive groove, and a contact member mounted adjacent said pawl and being movable to engage said pawl to move it so that the tooth is disengaged from the groove of said coupling, spring means biasing said pawl in the direction to engage said tooth in said groove.

4,289,087

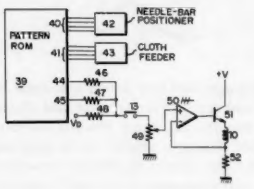
SEWING MACHINE WITH THREAD-TENSION CONTROL SYSTEM

Hideaki Takenoya; Kazuo Watanabe; Tamotsu Nakagawa, and Yoshinobu Tonomura, all of Hachioji, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 907,294, Mar. 6, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 80,070

Int. Cl.³ D05B *47/04*

U.S. Cl. 112—254 **20 Claims**



1. In a sewing machine of the type provided with pattern selector means operated by the user for implementing selected ones of a plurality of differently configured stitch-patterns, in combination, electromechanical thread-tension varying means operative for varying the tension of the thread fed to the sewing needle of the machine in response to a variable electrical tension command signal; and tension command signal generating means operative for furnishing to the electromechanical thread-tension varying means an electrical tension command signal, and including means for automatically selecting different values for the tension command signal, and thereby different values of thread tension produced by the thread-tension varying means, without the user of the machine needing to separately command said different values for the tension command signal, the means automatically selecting different values for the tension command signal being responsive to user operation of the pattern selector means, whereby the automatic selection of different values for the tension command signal is performed automatically as an incident to the user selecting different stitch-patterns.

4,289,088

STERILITY INDICATING DEVICE

John V. Scibelli, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Co., Saint Paul, Minn.

Filed Apr. 29, 1980, Ser. No. 145,214

Int. Cl.³ G01K *11/06*

U.S. Cl. 116—218 **9 Claims**

1. A device for indicating the attainment of sterility in a steam autoclave comprising

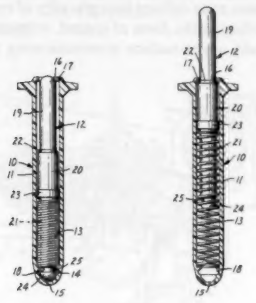
an elongate hollow element having means for permitting steam to enter the hollow portion thereof;

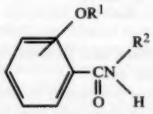
an indicating means within said hollow element that is movable relative to said hollow element;

a biasing means for causing movement of said indicating means relative to said hollow element; and

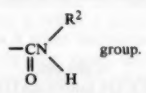
a restraining means within said hollow element for preventing movement of said indicating means until the attainment of a predetermined temperature in the presence of steam, whereupon said restraining means fuses and permits said biasing means to move said indicating means relative to said hollow element thereby indicating the

attainment of sterility, said restraining means having the formula





wherein R^1 is a lower alkyl group containing from 1 to about 4 carbon atoms, and R^2 is selected from hydrogen and lower alkyl groups containing from 1 to about 4 carbon atoms, and wherein said $-OR^1$ is located ortho or meta to said



group.

4,289,089

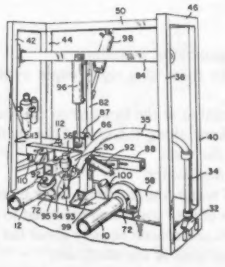
TIRE SEALANT APPLICATOR

Kenneth L. Tacke, Woodinville; Lyle D. Galbraith, and Hudson Stewart, both of Kirkland, all of Wash., assignors to Rocket Research Corporation, Redmond, Wash.

Division of Ser. No. 933,579, Aug. 14, 1978, Pat. No. 4,206,008, which is a continuation of Ser. No. 745,194, Nov. 26, 1976, abandoned. This application Dec. 3, 1979, Ser. No. 99,569

Int. Cl.³ B05B *13/06*

U.S. Cl. 118—306 **7 Claims**



7. An apparatus for positioning a sealant application device in the interior of a tire comprising:

a frame;

tire support means located adjacent said frame for supporting and rotating a tire;

arm means pivotally connected adjacent one end thereof for swinging movement between an advanced position wherein it is generally perpendicular to the axis of rotation of said tire and a retracted position remote from said tire;

means attached to said frame for engaging and positioning said arm when it is in said advanced position;

carriage means mounted on said arm means between said pivotal connection and said stop means for reciprocative movement along said arm means between a first position removed from the tire interior and a second position proximate to the tire interior when said arm means is in the advanced position;

means for mounting said sealant application device on said carriage means;

tire spreading means mounted on said carriage means for spreading the beads of a tire apart when said carriage means is in the second position;

first actuator means for moving said arm means between said advanced and retracted positions; and

second actuator means for moving said carriage between said first and second positions, whereby said sealant application device may be inserted into the interior of a tire by movement of said arm means into its advanced position followed by movement of said carriage means from its first position to its second position.

4,289,090

ELECTROSTATICALLY ISOLATED CARRIER FOR PAINTING APPARATUS

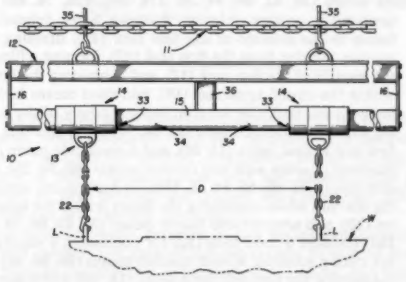
Thomas L. Bagby, Washington, and Gale C. Coombs, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/01131, § 371, Date Dec. 26, 1979, § 102(e), Date Dec. 26, 1979, PCT Pub. No. WO/01804, PCT Pub. Date Jul. 9, 1981.

This PCT application filed Dec. 26, 1979, Ser. No. 117,729

Int. Cl.³ B05B *5/02*

U.S. Cl. 118—630 **8 Claims**

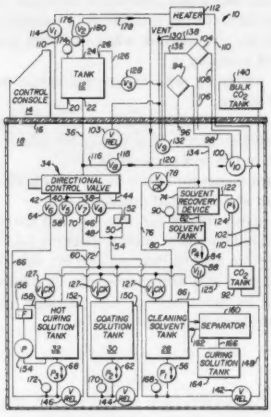


1. In an electrostatic painting apparatus (**10**) having a conveyor (**11**) and a carrier (**12**) attached to said conveyor and having suspension means (**13**) for attaching a metallic workpiece thereto, the improvement comprising said suspension means including at least one pair of adjustable bracket means (**14**) for attachment to a workpiece (W) and for sliding movements on said carrier to selectively adjust the longitudinal spacing (D) between the bracket means, each of said bracket means including a nonmetallic and electrically insulating first sleeve (**18**) slidably mounted on a support rail (**15**) of said carrier, a second sleeve (**20**) mounted on said first sleeve and carrying electrical contact means (**26**) thereon, workpiece attachment means (**19**) being attached to the second sleeve, and electrical power means operatively associated with said workpiece through said contact means, second sleeve and attachment means.

4,289,091
CLOSED APPARATUS FOR COATING THE INTERIOR OF A TANK

Hubert H. Warner, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 13, 1978, Ser. No. 973,042
Int. Cl.³ B05C 3/02
U.S. Cl. 118—642 **13 Claims**



1. A closed apparatus (**10**) for coating the interior of a first tank (**12**), comprising:

first means (**20, 22, 24, 26**) for connecting the first tank (**12**) to the apparatus (**10**) and providing a substantially closed system;

second means (**92, 110, 114, 126, 128**) for supplying a diluting gas to the first tank (**12**), controllably purging air from the first tank (**12**), and reducing the oxygen level therein;

third means (**30, 62, 60, 34, 36, 178, 180, 120, 74, 80**) for applying a coating solution that can form deleterious fumes to the interior of the first tank (**12**), draining the coating solution from the first tank (**12**), forming a film on the interior of the first tank (**12**), and containing the fumes within the closed apparatus (**10**), said third means including a second tank (**30**) for containing a supply of the coating solution, conduit means (**60, 34, 36**) for connecting the first and second tanks (**12, 30**), and a reversible pump (**62**) disposed in series with said conduit means (**60, 34, 36**); and

fourth means (**32, 68, 66, 34, 36, 184**) for heating and hardening the film while containing the fumes within the apparatus (**10**), and wherein said fourth means (**32, 68, 66, 34, 36, 184**) includes a third tank (**32**) for containing a supply of hot curing solution, second conduit means (**66, 34, 36**) for connecting the first and third tanks (**12, 32**), and a second reversible pump (**68**) disposed in series with said second conduit means (**66, 34, 36**).

4,289,092
LIQUID DEVELOPMENT FOUNTAIN

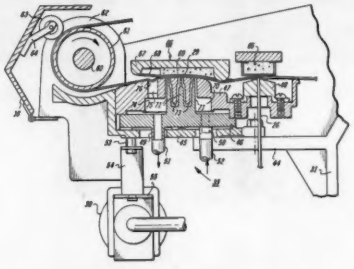
John L. McChesney, Cupertino, and Thomas A. Tacklind, San Jose, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 28, 1979, Ser. No. 79,674
Int. Cl.³ G03G 15/10
U.S. Cl. 118—660 **15 Claims**

1. A liquid development system for marking a record member moving in one direction and bearing a latent image, including means for storing liquid developer, fountain means having an inlet and an outlet, supply means connecting said storing means with said inlet, return means connecting said outlet with said storing means, the liquid developer flowing through said fountain from said inlet to said outlet generally in said one direction, said development system being characterized by said fountain means comprising

an upper surface for guiding said record member for movement thereagainst,

a development zone defined by a plurality of openings in said upper surface in the form of spaced, substantially parallel slots in said upper surface communicating with the interior of said fountain, said slots extending transversely to said one direction, and

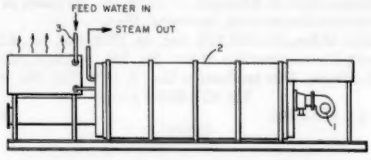


internal baffle means positioned to define a sinusoidal passageway extending from said inlet to said outlet through the interior of said fountain for directing the liquid developer to repetitively contact said record member through said slots.

4,289,093
STEAM GENERATOR

Robert W. Coggins, and Bert B. Miles, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 30, 1979, Ser. No. 89,674
Int. Cl.³ F22B 5/02
U.S. Cl. 122—197 **6 Claims**



1. A steam generator, including,

a shell in the form of a right angle cylinder horizontally extended,

a burner mounted at the first end of the shell to propagate a body of flame along the axis of the shell for a substantial length of the shell,

a source of feed water,

a first set of water and/or steam tube reaches connected to the source of feed water and mounted to extend the length of the shell and spaced equally about the circumference of the internal wall of the shell, and

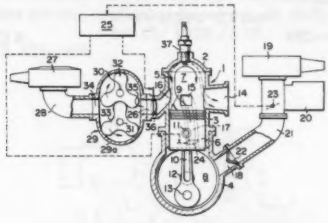
a second set of water and/or steam tube reaches connected to the source of feed water and mounted to extend the length of the shell and spaced equally about the circumference of the internal wall of the shell with each of the reaches of the second set paired with a reach of the first set of reaches about the circumference of the shell.

4,289,094

TWO-STROKE CYCLE GASOLINE ENGINE

Toshio Tanahashi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 31, 1979, Ser. No. 71,491
Int. Cl.[3] F02B 1/08
U.S. Cl. 123—69 R 12 Claims



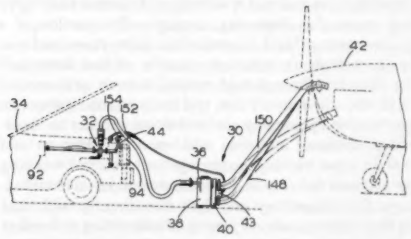
1. A two-stroke cycle gasoline engine comprising a cylinder bore, a piston slidably received in said cylinder bore so as to define a cylinder chamber, an exhaust port which opens from said cylinder chamber towards the atmosphere, a first scavenging port which has a relatively large opening area and injects fuel-air mixture into said cylinder chamber when uncovered by said piston, a second scavenging port which injects air into said cylinder chamber, a carburetor having a throttle valve for controlling engine load, a first passage which conducts fuel-air mixture from said carburetor towards said first scavenging port, a second passage which conducts air towards said second scavening port, a controller, a first control valve at a middle portion of said first passage connected to be controlled by said controller and which controls said first passage so as to throttle it when the engine load is below a predetermined relatively low value, and to open it when the engine load is above said predetermined relatively low value, and a second control valve at a middle portion of said second passage connected to be controlled by said controller and which controls said second passage so as substantially to interrupt it when engine load is below said predetermined relatively low value and to open it when the engine load is above said predetermined relatively low value.

4,289,095

PREHEATER FOR AIRCRAFT ENGINES

Ronald R. Scherr, 505 Little Broadway, Lemay, Mo. 63125

Filed Jul. 5, 1979, Ser. No. 54,848
Int. Cl.[3] F16K 11/00; B60H 1/04
U.S. Cl. 123—142.5 R 17 Claims



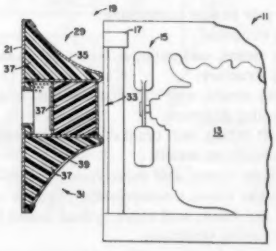
1. A preheater for aircraft engines to facilitate cold weather starting which comprises a preheater housing having a radiator means receiving hot engine coolant fluid therein, hose means for passing said hot fluid from an automobile engine heater system to said radiator and returning said fluid to said automobile engine heating system, blower means in said preheater housing for passing ambient air through said radiator to heat said air and forcing said heated air through ducts adapted to be directed to said aircraft engine to warm the engine and its lubrication systems to reduce the viscosity of the lubricant in said system, the blower means being powered by an electric motor and the source of electrical power being provided by electrical leads having means connecting said leads to the battery of the automobile, a selector valve means being provided in said automobile intermediate a first hot water inlet hose leading to the automobile heater and intermediate a second hot water outlet hose leading from the automobile heater, said selector valve means being further provided with ports adapted to be connected to said hose means passing to said perheater radiator and means are provided for removably connecting hose means to said valve ports, said hose means and radiator being filled with an engine coolant compatible with the engine coolant in said automobile, said hose connecting means automatically closing the ends of said hoses when they are removed from said valve ports whereby the preheater housing and hosing may be readily transferred to another automobile provided with said selector valve means.

4,289,096

ACCOUSTIC NOISE SUPPRESSION APPARATUS NOISE SUPPRESSION MEANS

David D. Latham; Cyril W. Von Fumetti, and Wayne R. Miller, all of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 2, 1979, Ser. No. 54,282
Int. Cl.[3] F02B 77/00
U.S. Cl. 123—198 E 9 Claims



1. An accoustic noise suppression apparatus for suppressing accoustic noise associated with the operation of a partially encased liquid-cooled internal combustion engine having a radiator in fluid communication with said engine, a fan to generate air flow through said radiator and encasement opening opposite said radiator, comprising:

(a) a housing fixably mounted to said encasement opposite said radiator and generally perpendicular to said air flow through said radiator and encasement opening, said housing having a back panel and opposing side panels;

(b) accoustic energy absorption material;

(c) first means for receiving a portion of said air flow and accoustic noise passing through said radiator and encasement opening, said first means to alter a portion of said air flow path to exhaust said air flow in a generally vertical direction to the environment and allowing a portion of said accoustic noise to encounter a portion of said accoustic energy absorption material, said first means securely mounted in said housing; and

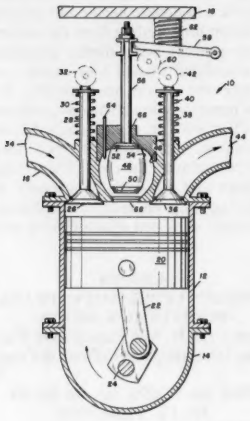
(d) second means for receiving another portion of said air flow and accoustic noise passing through said radiator altering said air flow path by channeling said air flow to exhaust said air flow through an opening in said back panel of said housing to the environment and allowing said accoustic noise to encounter a portion of said accoustic energy absorption material, said second means being securely mounted in said housing.

4,289,097

SIX-CYCLE ENGINE

Charles P. Ward, 5609 Selford Rd., Arbutus, Md. 21227

Filed Nov. 13, 1979, Ser. No. 94,040
Int. Cl.[3] F02B *19/02, 75/02*
U.S. Cl. 123—292 7 Claims



1. A six-cycle engine comprising:

a housing structure;

a cylinder means, said cylinder means being encased in said housing structure;

a crankcase means, said crankcase means being affixed to said housing structure;

a crankshaft means, said crankshaft means being positioned in said crankcase means;

a valve system means, said valve system means consisting of an air intake valve, a compression chamber valve, and an exhaust gas valve, said valve system means being affixed to said housing structure;

a compression chamber, said compression chamber being spherical-like in configuration, said compression chamber being centrally located over and adjacent to said cylinder means and located within said valve system means; and

a head means, said head means being affixed to and enclosing external portions of said valve system means; wherein said spherical-like compression chamber communicates with said cylinder means through an aperture therebetween, said compression chamber valve being located within said compression chamber and being so arranged so as to periodically at predetermined times for predetermined periods open and close said aperture by which said compression chamber communicates with said cylinder means, said compression chamber valve having a valve stem affixed thereto and passing through a wall of said compression chamber;

and wherein the configuration of said compression valve being barrel-like and having a slightly smaller diameter than that of said compression chamber,

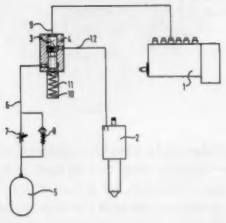
a first end of said barrel-like compression valve seating in said aperture when communication between said compression chamber and said cylinder means is to be closed, a second end of said barrel-like compression valve seating around said valve stem of said compression valve at said wall when communication between said compression chamber and said cylinder means is to be open and said first end of said compression valve is lifted from said aperture.

4,289,098

DEVICE FOR CONTROLLING PRELIMINARY INJECTION

Helmut Norberg, Stuttgart, and Richard Kinzel, Bensheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 31, 1979, Ser. No. 62,596
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1978, 2834633
Int. Cl.[3] F02M *45/04*
U.S. Cl. 123—299 4 Claims



1. A device for controlling the preliminary injection by intermediate relief for internal combustion engines including an injection pump, an injection nozzle, a housing having a uniform inner bore and a control slide valve slidable within said uniform housing bore, said control slide valve including a central bore, and upper, middle, and lower shoulders thereon, said shoulders forming a narrow central annular groove and a wider lower annular groove, said central bore including an axially aligned throttle directly opposite said upper shoulder thereon; said housing including an upper annular groove and a lower annular groove; a feed line connecting with said uniform bore in said housing for feeding fuel between said injection pump and said uniform inner bore, a spring for urging said control slide valve into a rest position, said control slide valve being displaceable from said rest position against the force of said spring by the fuel fed from said injection pump via said feed line to said uniform housing bore, a delivery line connecting with said upper annular groove in said housing for feeding fuel between said upper housing bore and said injection nozzle, a working chamber disposed upstream of said control slide valve, a fuel reservoir, a relief line connecting with said lower annular groove in said housing for feeding fuel between said lower housing bore and said reservoir, said control slide valve including means for displacing, during a first portion of a sliding movement of said control slide valve from said rest position, a preliminary injection quantity of fuel from said working chamber through said central bore in said control slide valve into said delivery line, said lower annular groove on said control slide opening-up said relief line in order to terminate said preliminary injection, said upper shoulder on said control slide valve closing the passage between said working chamber and said delivery line, said control slide valve including means for connecting said feed line directly with said delivery line, during a second portion of said sliding movement of said control slide valve, for purposes of principal injection, characterized in that said middle shoulder on said control slide valve closes-off temporarily the passage between said relief line and said working chamber so that said control slide valve is isolated from reservoir pressure and is thereby braked until the passage between said relief line and said working chamber is re-established before again interrupting the direct passage between said delivery line and said feed line during the return movement of said control slide valve to said rest position.

4,289,099

COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

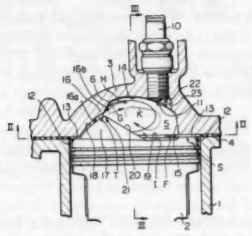
Kiyoshi Nakanishi, Susono; Kazuhiko Ito, Toyota; Takeshi Okumura, Susono; Isamu Iezuka, and Masao Yasukawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 17, 1979, Ser. No. 39,963

Claims priority, application Japan, Jul. 20, 1978, 53-87663

Int. Cl.³ F02B *23/08*

U.S. Cl. 123—307 **11 Claims**



1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head mounted on said cylinder block and having an inner wall;

a first raised portion having on its lower end a flat bottom face and being formed on the periphery of the inner wall of said cylinder head so as to project downwards;

a piston reciprocally movable in said cylinder bore and having a top face which has a flat peripheral portion approachable to said flat bottom face, the inner wall of said cylinder head and the top face of said piston defining a combustion chamber therebetween, said first raised portion having a substantially vertical side wall exposed to the combustion chamber;

an intake valve movably mounted on said cylinder head for leading a combustible mixture into said combustion chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere;

a spark plug having a spark plug recess located in said combustion chamber, said recess extending outwardly beyond a straight line extending between the peripheries of the intake and exhaust valves;

a first squish area spouting out a first squish flow as said piston reaches the end of its compression stroke, said first squish area comprising an annular area between said flat peripheral portion of the top face of said piston and the flat bottom face of said cylinder head, said first squish area extending substantially along the entire periphery of said top face of said piston;

a second raised portion formed on the top face of said piston at a position opposite to said first raised portion with respect to an axis of said piston and having a rear face and a front face exposed to said combustion chamber, said rear face being approachable to the inner wall of said cylinder head so as to create a second squish area therebetween at the end of the compression stroke for spouting out a second squish flow which moves foward in the upper interior of said combustion chamber in the direction opposite to the spouting direction of said first squish flow;

said first and second squish flows cooperating with each other to create a strong swirl motion rotating about a horizontal axis in said combustion chamber, said first squish area extending inward from the periphery of said top face of said piston to a continuous sinuous inner periphery which extends around and is almost vertically under said intake valve, said exhaust valve, and said spark plug recess and adjacent to said second raised portion;

a third raised portion formed on the inner wall of said cylinder head above said second raised portion and having a bottom wall which cooperates with said rear face of said second raised portion for creating said second squish area therebetween; and,

a surface area ratio of the sum of said first and second squish areas formed on the inner wall of said cylinder head and said first and second squish areas formed on the top face of said piston to the sum of the cross-sectional area of said cylinder bore and the surface area of the inner wall of said cylinder head, except for the surface area of the vertical side wall of said first raised portion, being in the range of 30 percent to 50 percent.

4,289,100

APPARATUS FOR CONTROLLING ROTATION SPEED OF ENGINE

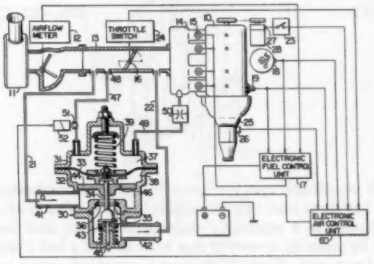
Masumi Kinugawa; Norio Omori, and Motoharu Sueishi, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 20, 1978, Ser. No. 971,215

Claims priority, application Japan, Jan. 20, 1978, 53-5362; Jan. 20, 1978, 53-5783[U]

Int. Cl.³ F02D *9/02*

U.S. Cl. 123—339 **7 Claims**



1. In an automotive engine system having a throttle valve for controlling the amount of air flowing into an engine therethrough and fuel supply means for supplying said engine with fuel in accordance with the amount of air flowing into said engine, an apparatus comprising:

an air valve for controlling the amount of additional air flow bypassing said throttle valve from upstream to downstream of said throttle valve;

an electromagnetic mechanism coupled to said air valve, for controlling an opening degree of said air valve in response to an input electric signal;

temperature sensor means for sensing the temperature of said engine;

speed sensor means for sensing the rotation speed of said engine;

an air-conditioner switch means for detecting whether a compressor of an air-conditioner is coupled to said engine as a load of said engine;

a transmission switch means for detecting that an automatic transmission for said engine has changed its shift position from a neutral position to a drive position, and generating a detection output signal indicative of said shift;

reference generating means for generating a reference rotation speed signal indicative of a desired idling rotation speed of said engine in response to the temperature sensed by said temperature sensor means and a detection output signal of said air-conditioner switch means;

comparing means for comparing the rotation speed sensed by said speed sensor means with said reference rotation speed generated by said reference generating means; and

driver means, responsive to an output signal of said comparing means, for generating the input signal to said electromagnetic valve to increase and decrease the amount of the additional air flow so that the idling rotation speed becomes the desired one, said driver means further responsive to either one of the detection output signals of said air conditioner switch means and said transmission switch means, for generating the input signal to said electromagnetic mechanism to increase the amount of the additional air flow independent of the output signal of said comparing means when said air-conditioner switch means detects that said compressor is coupled to said engine, or when said transmission switch means detects that said automatic transmission has changed its shift position to the drive position.

4,289,101

CENTRIFUGAL RPM GOVERNOR FOR INTERNAL COMBUSTION ENGINES

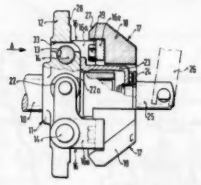
Peter Knorreck, Weissach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 13, 1980, Ser. No. 129,920

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1979, 2916869

Int. Cl.³ F02D *1/04*

U.S. Cl. 123—364 **6 Claims**



1. A centrifugal rpm governor for internal combustion engines, having at least two flyweights the mass of each of which is embodied as a separately manufactured part, and fastened firmly by securing screws to one lever arm of a bell crank, the other lever arm of which engages a governor sleeve and includes a bearing point in the region of the connection between said two lever arms, each flyweight being pivotably supported via a bearing bolt on a flange of a flyweight carrier, characterized in that one of said lever arms of said bell crank is embodied as an angle bracket open toward said flyweight carrier, said angle bracket having mutually parallel arms which laterally enclose said flange of said flyweight carrier and each of said parallel arms having a bearing bore which functions as a bearing point and said angle bracket further including a cross-piece which connects said two parallel arms, said cross-piece having an end face oriented away from said bearing bores, said end face further being firmly screwed to said flyweight mass with extremely high initial mechanical stress, and further wherein said flyweight mass is at the yielding-stress threshold of the substance from which said securing screws are made.

4,289,102

ENGINE SPARK TIMING CONTROLLING DEVICE

Masaaki Katsumata; Michio Onoda; Yasuo Takagi, all of Yokohama, and Kenji Yoneda, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

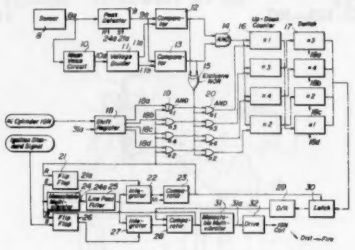
Filed Jul. 27, 1979, Ser. No. 61,432

Claims priority, application Japan, Aug. 1, 1978, 53/93967

Int. Cl.³ F02D *5/04*; F02P *5/04*; G01L *23/22*

U.S. Cl. 123—425 **5 Claims**

1. An engine ignition timing controlling device for an engine having a plurality of cylinders comprising a resonant type vibration sensor for detecting the knocking level of an engine and having a resonant frequency which is within the knocking frequency range of said engine, a means for detecting the mean vibrational level of the engine, means for sampling a peak value of an output signal of the sensor for a period of time which is inversely proportional to the engine speed and holding the sampled peak value until an ignition time for the next cylinder is reached, a means for comparing the mean vibrational level detected by said detecting means with said peak value sampled by said sampling and holding means, a means for generating an ignition standard signal corresponding to a driving condition



of the engine, a means for determining a retardation angle of ignition timing with respect to the ignition standard signal in accordance with an output signal of the comparing means, a means for generating an ignition timing signal based on the output signal of the determining means, wherein retardation angle of ignition timing with respect to said ignition standard signal is controlled when knocking occurs to optimize the knocking of the engine.

4,289,103

ALTITUDE COMPENSATING DEVICE OF AN INTERNAL COMBUSTION ENGINE

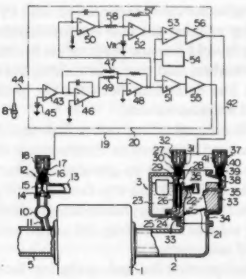
Kazuo Shinoda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 25, 1980, Ser. No. 210,304

Claims priority, application Japan, Nov. 30, 1979, 54-154171

Int. Cl.³ F02B *33/00*; F02M *7/00*

U.S. Cl. 123—440 **10 Claims**



1. An altitude compensating device of an internal combustion engine comprising an intake passage, a fuel feed apparatus arranged in said intake passage, an exhaust passage, and an air pump driven by said engine and connected to said exhaust passage via a secondary air feed passage, said device comprising:

a detector arranged in said exhaust passage for detecting the overall air-fuel ratio to produce a detecting signal;

a first comparator for comparing said detecting signal with a first reference voltage to produce an output signal, the potential of which is a high level when the total air-fuel ratio is less than the stoichiometric air-fuel ratio, but is a low level when the total air-fuel ratio is greater than the stoichiometric air-fuel ratio;

a first integrator for integrating the output signal of said first comparator;

an adder for adding an output signal of said first integrator to the output signal of said first comparator;

first means for generating a first train of pulses, each having a width which is proportional to the level of the output signal of said adder;

secondary air feed control means arranged in said secondary air feed passage and actuated in response to said first train of pulses for increasing the amount of the secondary air fed into said exhaust passage from said air pump in accordance with an increase in the width of the pulse of said first train of pulses;

a second integrator for integrating the output signal of said adder to produce an output signal having a level which corresponds to the mean value of the output signal of said adder and is increased in accordance with an increase in altitude, the time constant of said second integrator being greater than that of said first integrator;

second means for generating a second train of pulses, each having a width which is proportional to the level of the output signal of said second integrator, and;

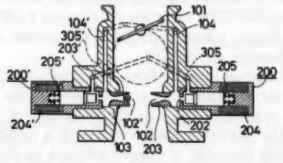
air-fuel ratio control means arranged in said fuel feed apparatus and actuated in response to said second train of pulses for increasing the air-fuel ratio of a mixture formed by said fuel feed apparatus to reduce the difference between the air-fuel ratio of said mixture and the stoichiometric air-fuel ratio when the altitude is higher than a predetermined level.

4,289,104

AIR-FUEL MIXTURE SUPPLYING DEVICE FOR INTERNAL COMBUSTION ENGINES

Shigetaka Takada, Ohbu; Masaaki Nomura, Okazaki, and Manabu Itoh, Anjo, all of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Sep. 25, 1979, Ser. No. 78,741
Claims priority, application Japan, Oct. 2, 1978, 53-121316
Int. Cl.³ F02M *51/06*
U.S. Cl. 123—471 **2 Claims**



1. In an air-fuel mixture supplying device for an internal combustion engine, having a throttle valve disposed in the intake system of the engine, a venturi portion provided at a downstream side of the throttle valve, a pair of sonic nozzle ports each opening at one of their ends, respectively, into both lateral sides of the venturi portion, mixing chambers provided at the other ends of the sonic nozzle ports and air bleed passages communicating with the other ends of the sonic nozzle ports and with a portion of the intake system upstream from the throttle valve, causing bleed air to pass into the venturi portion through said sonic nozzles ports, the mixing chambers being communicatable with the bleed air, the improvement comprising

the openings of said one ends of said sonic nozzle ports oppose each other such that the centers thereof are located in a common vertical plane,

a fuel injector connected to the mixing chamber at the other end of one of said sonic nozzle ports,

each of said sonic nozzle ports has an angle of divergence ranging between 8° and 22°,

said openings of said sonic nozzle ports at said one ends oppose each other such that the centers thereof are located in said common vertical plane as well as in a common horizontal plane,

another fuel injector communicates with the mixing chamber at the other end of the other of said sonic nozzle ports,

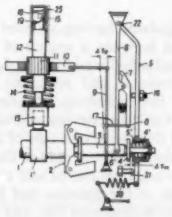
means for actuating said fuel injectors, respectively, so as to have non-overlapping periods of actuation such that air-fuel mixture from one of said sonic nozzle ports, respectively, is injected into the venturi portion and strikes pure air bleed injected into the venturi portion from the other of said sonic nozzle ports, respectively, and alternatingly.

4,289,105

FUEL INJECTION PUMP FOR A COMPRESSION-IGNITION ENGINE

John Noraberg, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Jan. 16, 1979, Ser. No. 3,971
Claims priority, application Austria, Jan. 17, 1978, 330/78
Int. Cl.³ F02M *59/26*
U.S. Cl. 123—500 **2 Claims**



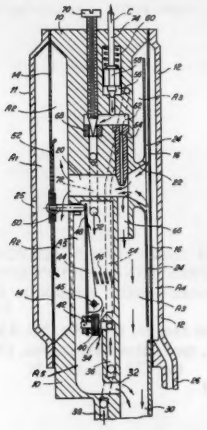
1. In a fuel injection pump for a compression-ignition engine which includes a fuel injection cylinder having an internal cylindrical bore, at least one control port communicating with said bore to supply fuel thereto or remove fuel therefrom, and a piston which is mounted so as to be axially reciprocated within said bore, as well as rotated therewithin, said piston including an upper control edge which determines initiation of fuel injection and a lower control edge which determines termination of fuel injection as the upper and lower control edges move past said control port, and with rotation of said piston determining the relative timing of movement of the control edges past said control port, the improvement wherein the upper and the lower control edges of said piston, when viewed in a vertical cross-section, extend with respect to an imaginary plane at the upper end of the piston perpendicular to the axis of said bore and in a direction between the respective axial points along said control edges which lie in the zone between the axial line along the piston which corresponds to a zone of the partial load area of the piston near the full load area thereof and the axial line which corresponds to the full load area, the partial load area being that portion of the piston which cooperates with the respective control bore during the partial load operation of the compression-ignition engine, as follows: the upper control edge curving upwardly towards said imaginary plane and the lower control edge curving downwardly and including a portion nearest the full load area which curves at a lower angle of inclination than the corresponding curved portion of said upper control edge.

4,289,106

PRESSURE REGULATOR FOR COMBUSTIBLE GASES, IN PARTICULAR FOR INTERNAL-COMBUSTION MOTORS

Pietro Parietti, Via Emilia Pavese 120, Piacenza, Italy

Filed Jul. 9, 1979, Ser. No. 55,726
Claims priority, application Italy, Jul. 21, 1978, 25988 A/78
Int. Cl.³ F02M *21/02*
U.S. Cl. 123—527 **15 Claims**



1. A pressure regulator having an inlet duct and an outlet duct for connection between a source of gaseous fuel under constant pressure and a fuel intake duct of an internal combustion engine, respectively, said regulator comprising a first assembly having a first membrane operatively connected at one side to a check valve and having said one side in communication via a central duct with one side of a second membrane and with said inlet duct, said one side of the second membrane cooperating with an adjacent rim of said central duct, a nozzle for introducing a jet of the gaseous fuel from said inlet duct into said central duct behind said rim, and a duct aligned with the nozzle so as to provide a path for said jet out of said central duct towards said inlet duct, the arrangement being such that a reduction of gaseous fuel pressure on said one side of the second membrane deforms said second membrane to cover said rim causing a reduction of gaseous fuel pressure in said central duct complemented by a reduction of gaseous fuel pressure therein caused by said jet, the reduced pressure being transferred to said one side of said first membrane to deform said first membrane in a manner to open said check valve, said check valve being located in a passage between said inlet duct and said outlet duct.

4,289,107

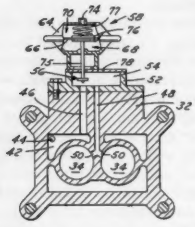
ENGINE CARBURETOR THROTTLE BLADE POSITIONING CONTROL

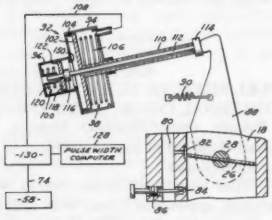
Douglas J. Peters, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1979, Ser. No. 107,979
Int. Cl.³ F02M *25/06, 3/00*
U.S. Cl. 123—571 **8 Claims**

1. An engine carburetor throttle valve position control comprising, in combination, a caburetor mounted on an engine and having an induction passage open to atmospheric pressure at one end and adapted to be connected to the engine intake manifold at the opposite end and including a throttle valve rotatably mounted across the passage movable open from an essentially closed throttle engine idle speed position and having a return movement, for controlling flow through the passage, spring means biasing the throttle valve towards the closed position, first vacuum controlled servo means having stop means extending into the path of movement of the throttle valve in a closing direction to predetermine the idle speed position of the throttle valve, passage means connecting a source of vacuum to the servo to vary the position of the stop means and thereby vary the idle speed setting of the throttle valve,

an exhaust gas recirculation (EGR) passage means connecting engine exhaust gases to the induction passage below the closed position of the throttle valve, a spring closed, vacuum opened EGR flow control valve mounted in the EGR passage means for a variable movement between





open and closed positions to control the volume of EGR gas flow, a second vacuum controlled servo means connected to the EGR valve for moving the EGR valve to an open position, means connecting the second servo means to the passage means, and

control means to control flow of vacuum to the first and second servo means to control opening of the EGR valve and to determine the idle speed setting of the throttle valve, the control means comprising a switching means alternately movable to supply vacuum to the first servo means while cutting off flow of vacuum to the second servo means and vice-versa.

4,289,108

EXHAUST GAS RECIRCULATION RATE CONTROL DEVICE

Giichi Shioyama, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Feb. 22, 1980, Ser. No. 123,569
Claims priority, application Japan, Feb. 23, 1979, 54-19845
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **8 Claims**

1. In an exhaust gas recirculation system for an internal combustion engine having a valve for controlling a flow rate of exhaust gas recirculated from an exhaust gas outlet to an intake air inlet of the engine, a control device comprising:

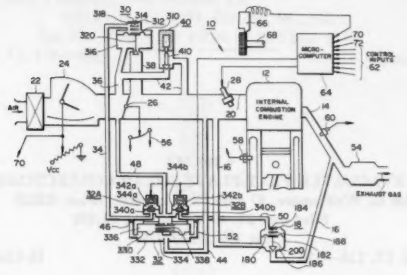
(a) first sensor for measuring a flow rate of intake air to the engine;

(b) second sensor for measuring the rotational speed of the engine;

(c) first calculating means for determining fuel injection time from the output of the first sensor;

(d) memory in which is stored a two-dimensional look-up

table of exhaust gas recirculation rates for a lattice of points representing values of rotational speed of the engine and fuel injection time; and



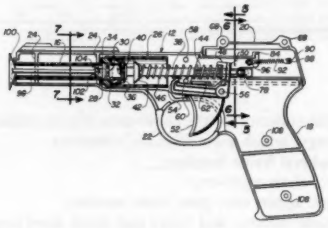
(e) second calculating means adapted to refer to the look up table and determine data corresponding to the fuel injection time calculated and the rotational speed of the engine measured, and supplying the data for control of the valve.

4,289,109

TOY AIR PISTOL WITH HOLLOW BREECH SLIDE

Bruce M. D'Andrade, Whitehouse Station, N.J., assignor to Arco Industries Ltd., Hong Kong, Hong Kong

Filed Apr. 25, 1980, Ser. No. 143,849
Int. Cl.[3] F41B *11/00*
U.S. Cl. 124—67 **5 Claims**



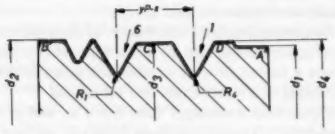
1. A toy air pistol for shooting relatively soft harmless elongated projectiles having a suction cup on one end and a thin piston on the other end, said pistol comprising in combination a rigid hollow molded housing having an elongated upper horizontal frame portion and a handle depending from the normally rearward end thereof, a trigger pivotally supported by said frame portion adjacent said handle, a cylindrical barrel of uniform diameter supported fixedly within said frame and extending inward from the normally forward end of said frame portion and axially extending from and communicating with a cylinder of uniform and larger diameter than said barrel affixed to the interior of said housing and extending rearwardly therein from said barrel, a piston slidably disposed within said cylinder and including a piston rod thereon extending rearwardly and axially from said barrel, a coiled compression spring surrounding said piston rod, a sear on one end of said trigger and a yoke on the other end extending perpendicularly to the axis of said cylinder, a transverse shoulder member on said piston rod adjacent and rearwardly of said piston and said piston rod extending through and rearwardly beyond said yoke on said trigger, the opposite end of said compression spring respectively abutting said shoulder member thereon and said yoke, and a simulated hollow breech slide having parallel opposite generally flat sides slidably supported by and external of the rearward portion of said upper horizontal frame portion above said handle for manual engagement and slidable movement along said horizontal frame portion, said opposite sides of said breech slide being provided with internal surfaces which slidably engage external surfaces of said rearward portion of said upper horizontal frame portion to provide the slidable support for said breech slide, and the rearward portion of said piston rod having a slot extending longitudinally from the rearward end thereof toward said piston, and a pin fixed transversely to and extending between said opposite sides of said breech slide rearwardly of said yoke and extending through said slot, whereby when said breech slide is moved rearward, said piston and piston rod are moved rearward and thereby compress said spring between said shoulder and yoke until said sear on said trigger latchingly engages said shoulder on said piston rod to cock the pistol for firing by pulling said trigger to disengage said sear from said shoulder and cause said piston to be instantly shot forward to compress air in said cylinder and discharge the same into said barrel against the piston on said projectile when positioned longitudinally in said barrel.

4,289,110

SHAPING ROLL

Erwin Junker, Talstrasse 78, 7611 Nordrach-Baden, Fed. Rep. of Germany

Filed Oct. 12, 1979, Ser. No. 85,056
Int. Cl.[3] B24B *53/06;* B23G *5/00*
U.S. Cl. 125—11 CD **4 Claims**



1. A shaping roll for forming a grinding wheel of a longitudinal feed thread grinding machine used for the manufacture of threads including a conically tapered first thread portion and a cylindrical second thread portion, said shaping roll having:

a first groove having flank and radius configurations corresponding to the conically tapered first thread portion to be formed;

a first cylindrical end surface adjacent said first groove and having a first diameter;

a second groove having flank and radius configurations corresponding to the cylindrical second thread portion to be formed;

a second cylindrical end surface adjacent said second groove and having a second diameter;

the depth of said first groove being less than the depth of said second groove;

the bottoms of said first and second grooves being spaced by an axial distance equal to an integral multiple of the pitch of the thread to be formed less an amount equal to the pitch distortion of the thread to be formed at the area of transition between the last thread of the conically tapered first thread portion and the cylindrical second thread portion;

said first diameter of said first cylindrical end surface being greater than said second diameter of said second cylindrical end surface; and

an intermediate cylindrical surface positioned axially between said first and second grooves and haing a diameter less than said first diameter and greater than said second diameter.

4,289,111

FRYING APPARATUS

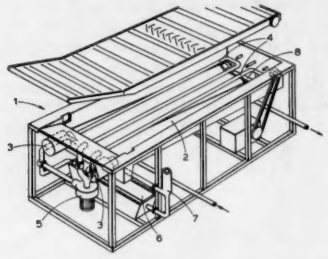
Michael E. Duncan, Bletchley; Philip J. Whittington, Chinnor, and Michael P. Kimber, Henley on Thames, all of England, assignors to DCA Industries Limited, Bucks, England

Filed Sep. 18, 1979, Ser. No. 76,547

Claims priority, application United Kingdom, Feb. 20, 1979, 05981/79

Int. Cl.³ A47J *27/00*

U.S. Cl. 126—391 **7 Claims**



1. Frying apparatus comprising:

a frying kettle adapted to contain a frying medium;

a pre-heater tank for preheating said fryer medium connected to said kettle to pass frying medium thereto;

at least one heat exchanger tube removably fitted in said kettle;

a high intensity suction burner for each tube adapted to produce combustion in said tube;

means for connecting each said burner to its respective tube;

a suction device connected to all of said tubes operable to produce a forced flow of combustion gases in said tubes and exhaust said gases from said tubes; and

an additional heat exchanger tube fitted in said pre-heater and adapted to receive hot gases from said suction device.

4,289,112

HEAT STORING SOLAR COLLECTOR DEVICE

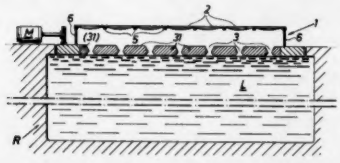
Rutger A. Roseen, Nyköping, Sweden, assignor to Studsvik Energiteknik AB, Nyköping, Sweden

Filed Oct. 16, 1978, Ser. No. 951,334

Claims priority, application Sweden, Nov. 1, 1977, 7712327

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—415 **19 Claims**



1. In a heat storing solar collector device comprising a liquid reservoir (R), an insulating lid (1) floating on the surface of the liquid (L), and solar collector means (2) over the lid, adapted to heat the liquid (L) of the reservoir (R), wherein the improvement comprises a plurality of spaced apart apertures (3) located in the lid (1) and wherein said collector means includes a plurality of lenses for concentrating incident solar radiation energy into respective concentrated radiation energy beams, the solar collector means (2) being oriented so that the radiation energy beams pass through respective apertures, whereby radiation energy is absorbed directly in the liquid mass (L) of the reservoir to heat the liquid mass.

4,289,113

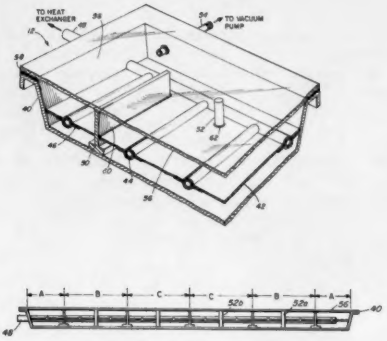
EVACUATED FLAT-PLATE SOLAR COLLECTORS

Peter G. Whittemore, 47 Elm Ct., Cohasset, Mass. 02025

Filed Jul. 27, 1979, Ser. No. 61,498

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—418 **16 Claims**



1. In a solar collector for the conversion of solar radiation to thermal energy, which solar collector comprises:

(a) a peripheral frame member;

(b) a lower sheet member;

(c) a single, upper, thin, glass sheet member;

(d) the frame member and lower and upper sheet members forming a shallow, sealed chamber adapted to be evacuated to a subatmospheric pressure or at a subatmospheric pressure;

(e) a chamber absorber means containing a fluid, to permit the fluid to absorb solar radiation passing through the upper, thin, glass sheet member, and to convert the solar radiation to thermal energy in the fluid, to increase the temperature of the fluid;

(f) means to introduce fluid, at one low temperature, into the absorber means and means to remove a higher temperature fluid from the absorber means;

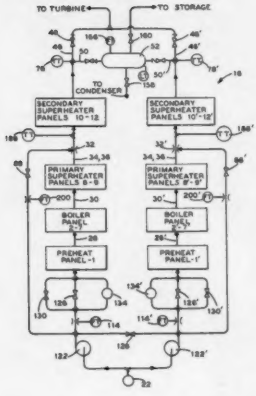
(g) means to support the upper, thin, glass sheet member, the improvement which comprises

a plurality of spaced-apart, generally parallel, glass sheet support elements within the chamber, and extending substantially the length of the chamber and positioned in a symmetrical, but nonlinear, manner with respect to the longitudinal center line of the chamber, so that the distance between the longitudinal support elements decreases as the support elements extend outwardly in position toward the peripheral edge of the frame member, so that the support elements dampen the harmonic vibrations of the supported, upper thin, glass sheet element, prior to the occurrence of stress fractures in the glass sheet element, thereby preventing fracture of the glass sheet element, when the chamber is under subatmospheric pressure.

4,289,114
CONTROL SYSTEM FOR A SOLAR STEAM GENERATOR

Allan J. Zadiraka, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 12, 1978, Ser. No. 941,700
Int. Cl.[3] F24J 3/02; F03G 7/02; F22G 5/12
U.S. Cl. 126—421 4 Claims



1. A control system having a solar steam generator comprising:

a series of solar-heated panels connected together to allow fluid flow therethrough, said series of panels forming a boiler section, a primary superheater section, and a secondary superheater section of a boiler assembly;

first means for measuring the temperature of the fluid at the outlet of the secondary superheater section and establishing a signal indicative thereof;

second means for measuring the temperature of the fluid at the outlet of said primary superheater section and establishing a signal indicative thereof;

means for controllably adding attemperation fluid into said secondary superheater section of said series of solar-heated panels;

a set point station establishing a signal indicative of desired fluid temperature exiting from said series of solar-heated panels;

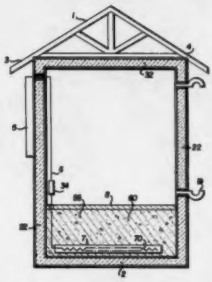
a comparison station for comparing the signal from said set point station with the signal from said first temperature measuring means to establish an error signal indicative of any difference between the compared signals; and

a summing station for adding the error signal from said comparison station to the signal from said second temperature measuring means to establish a control signal for controlling said attemperation means.

4,289,115
HEATING AND COOLING OF A HEAVILY INSULATED BUILDING THROUGH THE USE ONLY OF SOLAR ENERGY

Edward J. O'Hanlon, Assembly Point, Lake George, N.Y. 12845

Continuation of Ser. No. 827,339, Apr. 7, 1978, abandoned. This application May 4, 1979, Ser. No. 35,973
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—430 7 Claims



1. An assembly for maintaining a substantially constant living temperature in a shelter of the type defined by a plurality of highly insulated side walls extending partially beneath ground and partially above ground and joined at one end by a basement floor of highly insulative material and at an opposite end by a ceiling of highly insulative material with a floor extending between said side walls to divide said shelter into a subterranean area containing a heat storage material and separate area adaptable for human occupation located substantially above said subterranean portion and in heat transfer relationship therewith, comprising:

said shelter having a roof extending above said ceiling and joining said plurality of said walls, with at least one solar heat collector assembly mounted on said roof and facing outwardly from said shelter;

at least one heat collector assembly located adjacent to a surface of said ceiling defining said separate area;

each of said heat collector assemblies including at least one heat conductive conduit mounted therein adaptable for receiving a quantity of a working refrigerent fluid capable of boiling when subjected to a source of heat such as solar rays striking said heat collectors;

a plurality of separate container assemblies each positioned within said heat storage material located in said highly insulated subterranean area of said shelter;

each of said container assemblies including at least one heat conductive conduit adaptable for receiving working refrigerent fluid with each conduit being in heat transfer relationship with a portion of said heat storage material;

separate connector means providing a fluid passageway directly between a circuit mounted in a heat collector and a conduit mounted in a container assembly for reversibly transporting a quantity of said working refrigerent fluid therebetween.

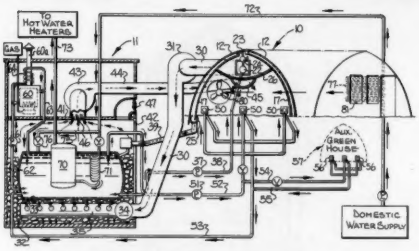
4,289,116
SOLAR HEATING SYSTEM FOR A GREENHOUSE OR OTHER BUILDING

Robert H. Williams, Maggie Valley, N.C., assignor to Meadowbrook Resort, Inc., Maggie Valley, N.C.

Filed Oct. 16, 1979, Ser. No. 85,380
Int. Cl.[3] F24J 3/02; A01G 9/00
U.S. Cl. 126—431 29 Claims

1. In a building having walls defining an enclosed interior, at least one of said walls including a light transmissive area for admitting light into the interior of the building, the combina-

tion therewith of a solar heat collector positioned at a light transmissive area of said wall, said collector comprising a plurality of elongate narrow strips of a radiation absorptive, heat conductive material having an outwardly facing surface exposed for receiving solar radiation and being heated thereby, said strips extending longitudinally downwardly and being positioned in laterally spaced relation from one another for admitting light therebetween into the building while also serv-



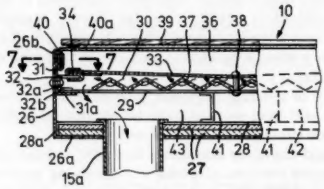
ing for partially shading the interior of the building, means cooperating with the upper end portions of said strips for directing a stream of heat transfer liquid onto said outwardly facing surface of the strips for flowing downwardly therealong in contact with the strips for transferring heat therefrom, and conduit means cooperating with the lower end portions of the strips for receiving the heated liquid as it flows from said heat conductive strips and directing the liquid to a predetermined location to permit utilization of the heat content thereof.

4,289,117

SOLAR PANEL UNIT AND SYSTEM FOR HEATING CIRCULATING AIR

Harry L. Butcher, 3081 E. 7110 South, Salt Lake City, Utah 84121

Filed Feb. 1, 1979, Ser. No. 8,438
Int. Cl.³ F24J 3/02
U.S. Cl. 126—436 **13 Claims**



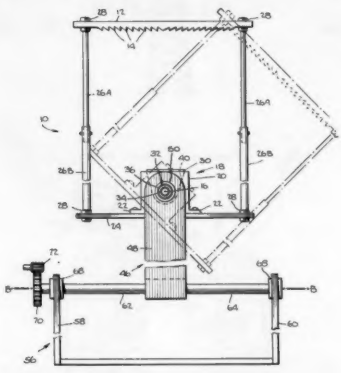
1. A substantially rectangular, solar panel unit for heating circulating air, comprising a heat collector plate freely mounted peripherally for expansion and contraction; a backing plate spaced below the collector plate to provide heat collector space; air-flow directing means sandwiched between the collector plate and the backing plate; a transparent outer panel spaced above the collector plate to provide dead air space for transmitting solar rays to the collector plate while inhibiting heat loss; peripheral walls enclosing the heat collector space and the dead air space to provide corresponding substantially closed chambers; thermal insulation material spaced and secured below the backing plate to provide space for air circulation; walls dividing the air circulation space into mutually parallel cool air and heated air passages, respectively, along mutually opposite sides of the unit; air flow ports leading into the heat collector chamber from the cool air passage along one side of said collector chamber; air flow ports leading from the heat collector chamber into the heated air passage along the other side of said collector chamber, the cool air and the heated air passages being adapted to be open at their ends, respectively, for air flow intercommunication with adjoining units in a solar heating system; and means mounting said heat collector plate for free expansion and contraction while substantially preventing flow of air into the dead air chamber.

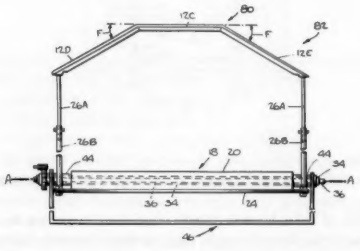
4,289,118

SOLAR ENERGY SYSTEM WITH PIVOTING LENS AND COLLECTOR AND CONDUIT SYSTEM THEREFOR

Virgil Stark, New York, N.Y., assignor to North American Utility Construction Corp., New York, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,288
Int. Cl.³ F24J 3/02
U.S. Cl. 126—440 **4 Claims**



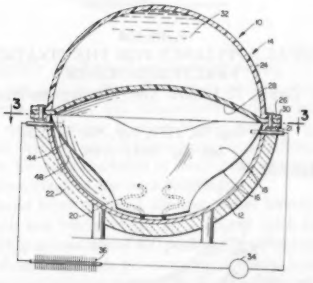


1. Apparatus for concentrating and collecting solar energy comprising an elongated collector including an elongated container in which at least one elongated conduit extends along a first elongated axis, elongated Fresnel-type lens means having prisms extending generally parallel to said first axis for concentrating the solar energy in an elongated focus, and first support means for supporting said lens means above said at least one conduit, said container having an elongated solar energy-transmitting aperture extending generally parallel to said first axis and facing said lens means, said at least one conduit being disposed below said aperture, said first support means including connecting means interconnecting said lens means and said container at first and second spaced apart locations for pivotal movement of said interconnected lens means and container with respect to said at least one conduit about said first axis so that said aperture faces said lens means during said pivotal movement and the elongated focus of the lens means is located substantially in or on and substantially along said at least one conduit, the products of the weights times the distances of components above and below said first axis being substantially equal whereby the moments above and

below said first axis are substantially equal and said apparatus is substantially balanced about said first axis, said apparatus further conprising second support means for supporting the interconnected container and lens means between said first and second locations for pivotal movement of the interconnected lens means and container about an axis transverse to said first axis.

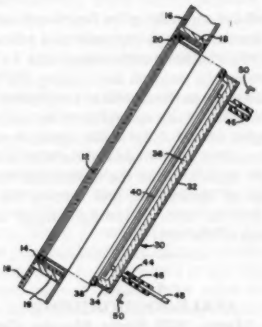
4. Apparatus for concentrating and collecting solar energy comprising an elongated collector including an elongated container in which at least one elongated conduit extends along a first elongated axis, lens means comprising at least three elongated Fresnel-type lenses having prisms extending generally parallel to said first axis, each for concentrating the solar energy in an elongated focus, a central Fresnel-type lens having prisms extending substantially parallel to said first axis, a second Fresnel-type lens adjacent to one end of said central Fresnel-type lens and having prisms extending in the same direction as the prisms of said central lens and inclined downwardly at an angle thereto towards said collector, and a third Fresnel-type lens adjacent to the other end of said central Fresnel-type lens and having prisms extending in the same direction as the prisms of said central Fresnel-type lens and inclined downwardly at an angle thereto towards said collector and opposed to said second Fresnel-type lens, first supporting means for supporting said lens means above said at least one conduit, said container having an elongated solar energy-transmitting aperture extending generally parallel to said first axis and facing said lens means, said at least one conduit being disposed below said aperture, said first support means including connecting means interconnecting said lens means and said container for pivotal movement of said interconnected lens means and container with respect to said at least one conduit about said first axis so that said aperture faces said lens means during said pivotal movement and the elongated focus of at least one of the Fresnel-type lenses is located substantially in or on and substantially along said at least one conduit, the products of the weights times the distances of components above and below said first axis being substantially equal whereby the moments above and below said first axis are substantially equal and said apparatus is substantially balanced about said first axis.

4,289,119
SOLAR COLLECTOR
Donald R. Meyer, Sr., North Haven, Conn., assignor to Soloptics, Inc., Meriden, Conn.
Filed Feb. 22, 1979, Ser. No. 13,920
Int. Cl.³ F24J 3/02
U.S. Cl. 126—440 **16 Claims**



1. A solar collector comprising a collector body, means securing said collector body in fixed and static position on the surface of the earth at a fixed latitudinal and longitudinal position, energy absorbing means disposed in fixed position on said collector body and having an energy absorbing surface for receiving and absorbing solar energy, lense means mounted in fixed position on said collector body for continuously focusing rays of the sun on said absorbing surface throughout the year including the solar days of the summer and winter solstice at said fixed latitudinal and longitudinal position, said absorbing surface having a peripheral shape defined by locii of centroids of the focii of said rays of the sun focused on said absorbing means by said lense means during said solar days of the summer and winter solstice as determined by the fixed and static position of said collector body at said fixed latitudinal and longitudinal position.

4,289,120
SOLAR HEAT COLLECTING APPARATUS
William H. Ward, 2 Albion La., Cincinnati, Ohio 45246
Filed Aug. 2, 1979, Ser. No. 63,301
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 **6 Claims**



1. A solar heat collecting device comprising:

a wall or roof portion of a structure defining an opening therein;

a box-like housing of generally rectangular cross section substantially coextensive with and positionable in said opening defined in said wall or roof and having a substantially planar base portion and four upstanding side walls connected thereto;

insulation means disposed inside said housing and extending substantially coextensive with the base portion thereof;

solar heat collection means disposed within said housing above said insulation means parallel to said base portion of said housing and having means for circulating a heat conducting fluid therethrough to and from a remote location;

a transparent cover member extending beyond said side wall portions of said housing and permanently securable to the outer surface of said wall or roof of said structure and overly covering said opening defined in said wall or roof of substantially coextensive rectangular cross section as said housing;

means fixedly securing said cover member to said wall or roof; and

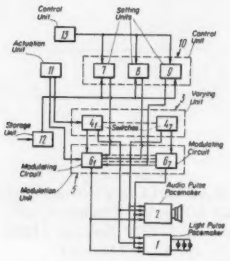
means for mounting said housing within said opening defined in said wall or roof for removal into the interior of said structure for service and maintenance of said solar heat collection means without removal of said transparent cover member from said wall or roof of said structure.

4,289,121

METHOD FOR CONTROLLING FUNCTIONAL STATE OF CENTRAL NERVOUS SYSTEM AND DEVICE FOR EFFECTING SAME

Leonid I. Kupriyanovich, ulitsa Dunaevskogo, 4, kv. 61, Moscow, U.S.S.R.

Filed Sep. 4, 1979, Ser. No. 71,854
Claims priority, application U.S.S.R., Nov. 26, 1978, 2686052
Int. Cl.³ A61M *21/00*
U.S. Cl. 128—1 C **14 Claims**



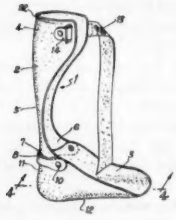
1. A method for controlling the functional state of the central nervous system through exposure of a patient to simultaneous effects of a rhythmic audio signal and a rhythmic light signal, comprising the steps of: determining the change of the biorhythm frequency in the course of a transition to one of the extreme stable states of the central nervous system; setting an initial light signal and an initial audio signal; synchrononously varying the frequency, amplitude and duration of the rhythmic audio and light signals within the established intervals of frequency change of biorhythms; and varying the pitch of the audio signal and the color of the light signal in accordance with the change of the intervals.

4,289,122

ANKLE-FOOT ORTHOSIS

Randy D. F. Mason, 3825 Sierra Morena, Carlsbad, Calif. 92008, and William Vuletich, 1210 Caminito Septimo, Cardiff, Calif. 92007

Filed Apr. 23, 1979, Ser. No. 32,568
Int. Cl.³ A61F *3/00, 5/04*
U.S. Cl. 128—80 E **4 Claims**



1. An ankle-foot brace securable to a patient's leg for controlling the ankle movement which comprises:

a unitary plantar element made of hard, thin-sheeted material having an upward projection shaped and dimensioned to wrap intimately around the heel and ankle area;

a unitary leg element made of hard thin-sheeted material having an upper portion shaped and dimensioned to wrap intimately around the calf, a shank extending downward from said upper portion along the back of the lower leg, a broadening lower portion at the lower end of said shank partially extending over said projection and over both sides of said ankle area, and means for securing said upper portion to the leg;

means for pivotally attaching the upward projection of the plantar element to the broadening lower portion of the leg element at ankle level about the normal flexure axis of the ankle; and

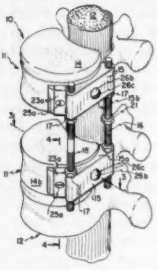
means integral with said plantar element and said leg element for limiting the backward movement of the leg element in relation to the plantar element.

4,289,123

ORTHOPEDIC APPLIANCE

Harold K. Dunn, 3848 Cliff Dr., Salt Lake City, Utah 84109

Filed Mar. 31, 1980, Ser. No. 135,328
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—84 R **7 Claims**



1. An improved orthopedic appliance consisting of,

a pair of brackets each contoured on one surface to closely fit to a vertebral body portion of a human vertebra, which brackets include oppositely threaded holes formed therethrough that are aligned when the brackets are properly installed to the vertebral body portions;

means for securing each said bracket to a separate vertebral body portion consisting of, a U-shaped staple that includes means for securing it to a saddle portion of each said bracket such that legs of said staple extend outwardly from said bracket contoured surface, and, means, additional to said staple, for connecting each said bracket to said vertebral body portion; and

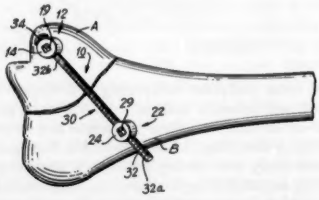
a spacing adjustment rod having oppositely threaded ends arranged to turn into said oppositely threaded holes in said brackets.

4,289,124

SURGICAL APPLIANCE FOR THE FIXATION OF FRACTURED BONES

Robert E. Zickel, 75 Villard Ave., Hastings-on-Hudson, N.Y. 10706

Filed Sep. 18, 1978, Ser. No. 943,213
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—92 D **3 Claims**



1. A surgical appliance for the fixation of fractured bones,

comprising a first anchoring member having a threaded shaft adapted to be embedded into one segment of a fractured bone, said first anchoring member having a substantially cylindrical head portion extending from said threaded shaft and including a channel therethrough for receiving a bolt; a second anchoring member having a threaded shaft adapted to be embedded into another segment of said fractured bone, said second anchoring member having a substantially cylindrical head portion extending from said second-mentioned threaded shaft and including a channel therethrough for receiving said bolt, one of said channels being threaded, each of said substantially cylindrical head portions further including a receptacle therein for receiving an insertion tool which, when rotated, drives the threaded shaft of the respective anchoring member into said respective segment of said fractured bone; and a bolt having a shaft and a head, at least a portion of said shaft being provided with screw threads which mate with the threads of said one channel, the shaft of said bolt being adapted to pass through the channel of said first anchoring member and to be threadedly received in the channel of said second anchoring member such that said shaft, when received by both channels of the cylindrical head portions of said anchoring members, extends substantially perpendicular to the threaded shafts of each of said anchoring members, so as to exert a compressional force on said one and other segments of said fractured bone when said bolt is tightened.

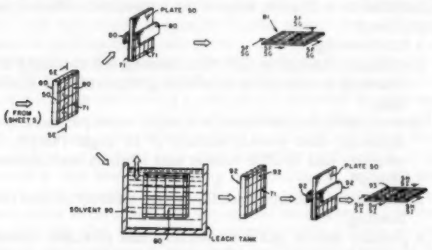
4,289,125
POLYMERIC SHEETS

John H. Hung, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Continuation of Ser. No. 735,671, Nov. 1, 1976, Pat. No. 4,175,557, Continuation-in-part of Ser. No. 634,908, Nov. 24, 1975, Pat. No. 4,034,751. This application Jun. 26, 1979, Ser. No. 52,221

Int. Cl.[3] **A61F** *13/06;* **A61L** *15/01*

U.S. Cl. 128—156 **19 Claims**



1. A drapable synthetic burn dressing having (1) a fabric texture on one surface thereof which provides a reservoir for debris from a burn and (2) substantially uniform physiologic properties approximating those of human skin, comprising:

(a) a first layer of cured high-release non-sticking silicone rubber, having a thickness of about 1 mil or less and forming one surface of the burn dressing;

(b) a second layer of cured silicone rubber having a tensile strength and tear strength for a 25 mil thick cured film thereof of at least about 400 pounds per square inch and at least about 20 pounds per inch, respectively, joined to the first layer of silicone rubber; the first and second layers of silicone rubber having a total thickness of about 2 mils or less and forming an ultra-thin, pinhole-free, substantially non-porous and voidsfree membrane; and

(c) a third layer of fabric texture joined to the second layer of silicone rubber and forming the other surface of the burn dressing;

the burn dressing having a water vapor phase transfer rate of about 2 to 10 mg./hr.-cm.^{2}, a two dimensional elongation of at least about 100% in each direction, and anti-microbial barrier layer properties.

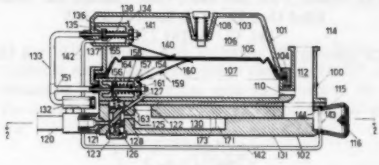
4,289,126
PRESSURE REGULATOR FOR BREATHING APPARATUS

Ali A. Seireg, and Amr M. S. Baz, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 2, 1979, Ser. No. 35,317

Int. Cl.[3] **B63C** *11/00;* **A62B** *7/04*

U.S. Cl. 128—204.24 **15 Claims**



1. A pressure regulator for use with breathing apparatus which provides breathing mixture at a substantially constant pressure above ambient and which also provides breathing mixture at a substantially lower control pressure, comprising:

(a) a case having interior walls defining a breathing chamber therein, and a breathing port and an exhaust port in said case both of which are in communication with said breathing chamber;

(b) a pneumatically operable main supply valve communicating with said breathing port and adapted to receive breathing mixture and switchable to open to supply breathing mixture to said breathing port;

(c) a low pressure control valve adapted to receive control pressure breathing mixture at a pressure substantially less than that supplied to said main supply valve, said control valve being biased closed and switchable to open to supply a low pressure breathing mixture control signal;

(d) means responsive to the pressure in said breathing chamber for opening said control valve when the pressure in said breathing chamber drops below ambient;

(e) fluidic control means responsive to the control pressure output signal from said control valve for providing a pneumatic output signal to switch said main supply valve to its open position providing breathing mixture to said breathing port, said fluidic control means also responsive to pressure in said breathing chamber for switching said main supply valve to its closed position when the pressure in said breathing chamber exceeds ambient pressure;

(f) passageways formed in the walls of said exhaust port which are adapted to direct breathing mixture flowing therethrough outwardly to provide power assist to draw used breathing mixture therethrough;

(g) an exhalation assist valve communicating with said exhaust port passageway and adapted to receive breathing mixture under pressure, including a valve body formed in said case and having a valve opening formed therein for receiving breathing mixture under pressure which is directed through said valve body to said passageways in said exhaust port, and a valve closure member biased by a spring to close off said valve opening and switchable to open to supply breathing mixture to said passageways in said exhaust port; and

(h) means responsive to pressure in said breathing chamber for switching said exhalation assist valve open when the pressure in said breathing chamber is above ambient, whereby exhalation by the diver will increase the pressure in said breathing chamber above ambient and will result in breathing mixture under pressure being directed to said exhaust port to assist the exhalation of the used breathing mixture therefrom, said means responsive to pressure including a flexible diaphragm mounted across a cavity

formed in said case which is in communication with said breathing chamber, said flexible diaphragm being mounted to said valve closure member of said exhalation assist valve such that pressure above ambient in said breathing chamber will cause said flexible diaphragm to force said valve closure member away from said valve opening against the force of said spring biasing the same closed.

4,289,127

BREATHING APPARATUS STABILIZER

Byron G. Nelson, P.O. Box 6457, Lake Charles, La. 70606

Filed Oct. 29, 1979, Ser. No. 89,035

Int. Cl.³ A61M *15/06*

U.S. Cl. 128—207.14 **4 Claims**

1. In a breathing apparatus of the kind which fits inside the mouth of a human between cheek and teeth, which kind has tube means for air flow, said tube means having at least one upstream air opening proximate the lips, said tube means adapted and being of a length sufficient to extend from the front of the mouth back down the side of the mouth between cheek and teeth to the rear of the mouth adjacent the molars, said tube means having at least one downstream air opening adapted to communicate the interior of said tube means with said rear of said mouth, said downstream air opening being located at a point adjacent the molars, with said upstream opening in combination with said downstream opening being sized to permit a flow of respirated air through said tube means approximate the flow of air said human could achieve through normal nasal breathing; an improvement comprising stabilizing means affixed and extending laterally from said tube means, said stabilizing means being adapted to fit between the cheek and jaw gum and adapted to contact the jaw gum.

4,289,128

LARYNGEAL TUBE

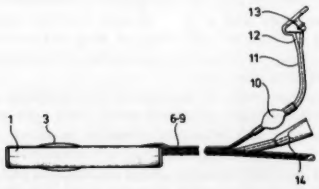
Heinz Rüsch, Waiblingen, Fed. Rep. of Germany, assignor to Willy Rusch GmbH & Co. KG., Kernen, Fed. Rep. of Germany

Filed Jun. 15, 1979, Ser. No. 49,021

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828447

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—207.15 **21 Claims**



1. In a laryngeal tube for use during surgery on a patient:

means for insertion in the larynx including a first tube,

inflatable cuff means, located around at least a portion of said first tube, for holding the first tube in the larynx when the cuff means is inflated,

elongated means extending from said first tube to the mouth when the first tube is in the larynx including (a) means for inflating the cuff means comprising a second tube which when in use extends at least part of the distance from the mouth of the patient to said cuff means, and (b) ventilation means for providing respiration to the patient comprising a third tube extending from the mouth far enough down the throat to provide a respiratory function to the patient,

the improvement comprising:

said elongated means being attached to said including stiffening means to enable said first tube to be placed down the throat of said patient without the use of a surgical instrument and said second and third tubes being attached to said elongated means to prevent said second and said third tubes from interfering with the surgery.

4,289,129

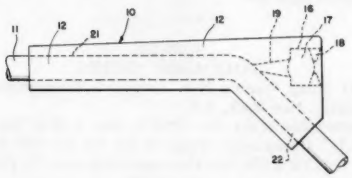
INJECTION SITE APPARATUS

Roger S. Turner, 620 Carpenter La., Philadelphia, Pa. 19119

Filed Nov. 1, 1979, Ser. No. 90,499

Int. Cl.³ A61M *5/14*

U.S. Cl. 128—214 G **28 Claims**



1. An injection site apparatus of the type adapted to be connected to a flexible tube of an intravenous delivery set, comprising:

a tube housing,

a recessed channel in said tube housing for receiving and retaining a continuous unbroken portion of said flexible tube,

said recessed channel having a straight outlet portion and an adjoining inlet portion formed at an angle thereto for retaining said flexible tube at said angle in said recessed channel,

a piercable hypodermic needle closure receiver on said tube housing,

a primary needle guide connecting said piercable closure receiver with a portion of said recessed channel,

a piercable closure mounted on said piercable closure receiver adapted to be punctured by a hypodermic needle, and

a secondary needle guide provided on said piercable closure receiver adjacent said piercable closure,

said hypodermic needle being insertable through said piercable closure and said needle guides to be guided into the center of said flexible tube.

4,289,130

ABSORBENT MATERIAL FOR SANITARY PRODUCTS

Akira Usami, Sakai; Toshiaki Uebayashi, Himeji; Koji Sato, Kyoto, and Tomoko Goda, Kochi, all of Japan, assignors to Daicel Ltd., Osaka and Fuji Sanitary Industries Co., Ltd., Kochi, both of, Japan

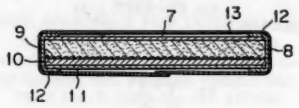
Filed Aug. 21, 1979, Ser. No. 68,534

Int. Cl.³ A61F *13/16*

U.S. Cl. 128—287 **11 Claims**

1. In a sanitary product having a multilayered structure comprising a covering layer suitable for contact with the human body, a liquid excretion-leakproof layer and an absor-

bent layer interposed between the covering layer and the liquid excretion-leakproof layer, the improvement comprising employing as the absorbent layer, a layer of cellulose acetate



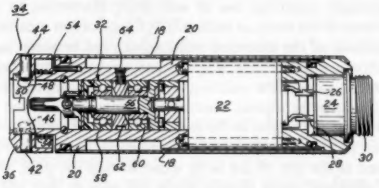
fibers or a mixture of cellulose acetate fibers and cellulose fibers, the cellulose acetate fibers having an irregular cross-section and having a filament denier of less than 8 deniers.

4,289,131

SURGICAL POWER TOOL

Rene E. Mueller, Osceola, Ind., assignor to Ergo Instruments, Inc., Granger, Ind.

Filed May 17, 1979, Ser. No. 39,756
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—303 R **10 Claims**



1. A surgical power tool comprising a drive unit including an outer housing, an inner sleeve disposed therein, a power supply unit in said sleeve, a bearing in said sleeve, an intermediate shaft operatively connected to said power unit and journaled in said bearing in said sleeve, and a seal structure on said shaft and in said sleeve for excluding moisture from said power supply unit; and a drive shaft assembly releasably attached to said drive unit and having a portion of a diameter slidable into said sleeve, a slot in the forward end edge of said sleeve, and a pin projecting outwardly from said portion of said drive shaft assembly and slidable into said slot when said portion is inserted in said sleeve, a latching mechanism for securing said drive shaft assembly to said drive unit, said mechanism having an annular shaped rotatable cap around said sleeve and having at least one slot therein for registering with the slot in said sleeve, and a groove in said sleeve inclining outwardly in the direction in which said cap is rotated to align said slots, and a pin extending inwardly from said cap into said inclined groove for positioning said cap to firmly hold said drive shaft assembly in said sleeve, and an instrument attachment head on said drive shaft assembly for receiving a medical instrument to be operated by said drive unit.

4,289,132

SURGICAL INSTRUMENT AND METHOD OF USING THE SAME

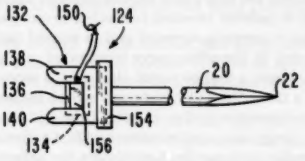
Robert D. Rieman, 2641 NE. 27th Ter., Fort Lauderdale, Fla. 33306

Filed Jun. 25, 1979, Ser. No. 51,746
Int. Cl.³ A61B *17/36*
U.S. Cl. 128—303.14 **10 Claims**

10. A surgical instrument for detaching a posterior portion of a meniscus in a knee comprising

a slender rigid rod having a sharp point at one end for being inserted through an anterior incision, inside a collateral ligament and then outward by penetration through skin tissue at a location behind the collateral ligament;

a cartilage cutting tool mounted on the other end of the rod for being manipulated by a portion of the rod extending outside of the skin tissue to perform a surgical procedure; and



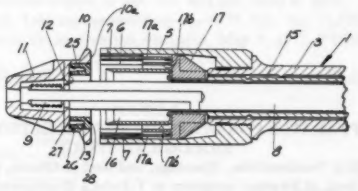
said cartilage cutting tool including an insulative blade holder, a metal blade mounted in the blade holder, and an insulation coated electrical wire connected to the blade for connecting the blade to an electrical surgical generator.

4,289,133

CUT-THROUGH BACKUP WASHER FOR THE SCALPEL OF AN INTRALUMANAL SURGICAL STAPLING INSTRUMENT

Robert G. Rothfuss, Bellevue, Ky., assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Feb. 28, 1980, Ser. No. 125,566
Int. Cl.³ B31B *1/00*
U.S. Cl. 128—334 C **12 Claims**



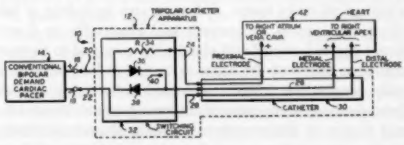
1. In a surgical stapling instrument having a scalpel; the improvement comprising: a backup member for said scalpel, said backup member having a pair of parallel spaced walls, said walls having corresponding edges, said corresponding edges being joined by a thin web, said web providing a backup surface for said scalpel severable by said scalpel, said walls and web constituting an integral, one piece structure of semi-rigid material.

4,289,134

TRIPOLAR CATHETER APPARATUS

Robert I. Bernstein, Tenafly, N.J., assignor to Electro-Catheter Corporation, Rahway, N.J.

Filed Jul. 23, 1979, Ser. No. 59,523
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **32 Claims**



1. A tripolar catheter apparatus connectable to a bipolar demand cardiac pacer having a common pacer terminal pair for providing both cardiac depolarization sensing and cardiac stimulation in a human patient dependent on the mode of said

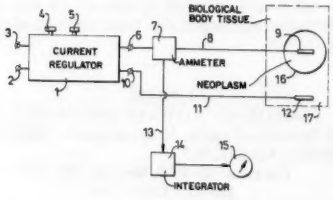
pacer, said sensing being provided in a sensing mode and said stimulation being provided in a stimulation mode, said catheter being insertable through a portion of the patient's curculatory system into the heart, said tripolar catheter apparatus comprising a first catheter terminal connected to one pacer terminal of said pacer common terminal pair, a second catheter terminal connected to the other pacer terminal of said pacer common terminal pair, a first proximal electrode, a second medial electrode, a third distal electrode and switch means responsive to the provision of a cardiac stimulus from said pacer, said switch means being connected between said first catheter terminal and said medial and proximal electrodes for selecting either said medial or proximal electrode dependent on the provision of said cardiac stimulus from said pacer, said distal electrode being connected to said other catheter terminal irrespective of said selection of said medial or distal electrode, said distal and medial electrodes comprising intra-ventricular electrodes, said proximal electrode comprising an extra-ventricular electrode, said switch means being responsive to the provision of said cardiac stimulus from said pacer in said pacer stimulating mode for providing said stimulus to the heart between said intra-ventricular distal and medial electrodes during the presence of said cardiac stimulus, said switch means being responsive to said pacer sensing mode for providing said depolarization sensing from the heart between said intra-ventricular distal electrode and said extra-ventricular proximal electrode, whereby said bipolar demand cardiac pacer is usable as a tripolar demand cardiac pacer.

4,289,135

APPARATUS FOR DESTROYING A SELECTED PART OF BIOLOGICAL TISSUE

Björn Nordenström, Rönninge, and Jerker Olsson, Bandhagen, both of Sweden, assignors to Tekniska Rontgencentralen AB, Sweden

Filed Nov. 19, 1979, Ser. No. 95,420
Claims priority, application Sweden, Nov. 23, 1978, 7812092
Int. Cl.[3] A61N *1/20*
U.S. Cl. 128—419 R **5 Claims**



1. An apparatus for destroying a neoplasm such as a tumor in a biological body tissue, said apparatus including at least two electrodes, means to connect said electrodes to a source of direct current, one of said electrodes arranged to be inserted in said neoplasm and the other arranged to be placed in electrically conductive contact with said body tissue at a distance from the neoplasm, current measuring means located between said source of direct current and one of said electrodes, integrating circuit means connected to said current measuring means for time-integrating the current passing between the electrodes, and an indicator connected to the integrating circuit means for indicating the total ampereseconds applied to the neoplasm and body tissue during a treatment period.

4,289,136

PERCUTANEOUS PAIN ALLEVIATOR METHODS

Donald D. Rienzo, Sr., 511 Wolf Hill Rd., Dix Hills, N.Y. 11746

Filed Nov. 13, 1979, Ser. No. 94,034
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—421 **5 Claims**

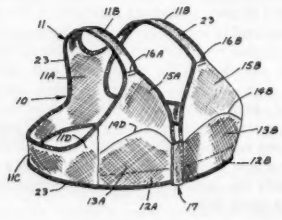
1. The method of alleviating pain at a portion of the body of a user comprising the steps of generating periodically recurring electrical pulse signals, applying said pulse signals to a base electrode and at least one other electrode, positioning the base electrode at the site of the body experiencing the pain, scanningly applying one of said other electrodes to various portions of the body, at each point of application measuring the amplitude of the electrical pulse signals fed between said base electrode and said one of said other electrodes, indicating the point of application yielding the maximum amplitude of the electrical pulse signals, thereafter positioning at least one of said other electrodes at the indicated point of application for a given period of time while said base electrode remains positioned at the site of the body experiencing the pain, whereby the electrical pulse signals block the pain at that site of the body.

4,289,137

SPORTS BRASSIERE

Dorothy G. Dell, and Christine H. Clifford, both of Rte. 1, Box 560, Waldo, Fla. 32694

Filed Aug. 15, 1979, Ser. No. 66,815
Int. Cl.[3] A41C *3/02*
U.S. Cl. 128—482 **5 Claims**



1. A brassiere comprising an underbust band portion, a back member and strap support including side bands attached to said underbust band and passing toward the back of a wearer, shoulder straps for passing up over the shoulders of a wearer, and a pair of bust cups attached to said underbust band and to said straps, said bust cups each comprising two portions including a lower portion and an upper portion, the lower portion of said bust cups being of easily yieldable fabric, and the upper portions of said breast cups being made of a material which resists substantial upward movement of the breast of a wearer under inertial forces caused by sports activities of the wearer, said back member comprising a single substantially vertical band positioned near the center of the back of a wearer, said shoulder straps being attached to and extending from said

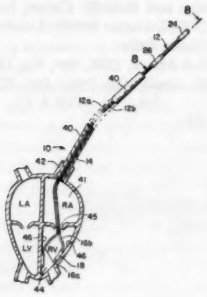
vertical band, and the side bands also extending from said vertical band.

4,289,138

ELECTRODE ASSEMBLY FOR TEMPORARY PACING AND HEART MEASUREMENTS

Kenneth Halvorsen, Huntington Beach, Calif., assignor to Medical Testing Systems, Inc., Fountain Valley, Calif.

Filed Jun. 9, 1980, Ser. No. 157,504
Int. Cl.³ A61B 5/04
U.S. Cl. 128—642 **10 Claims**



1. An electrode assembly for insertion into a catheter and establishing an electrical connection to an electronic circuit, said assembly comprising:

a plurality of wires, each of said wires insulated from each other and each of said wires being electrically conductive and extending together side-by-side and having different lengths at one end thereof;

an insulated other wire binding said plurality of wires together for substantially their entire length except for a free end at said one end of each of said wires;

an end portion of each of said free ends being bared of insulation;

an electrically conductive ferrule positioned on each of said bared portions on each of said free ends of said wires, said ferrules being spaced apart axially of each other when axially aligned with said free ends of said wires inside said catheter; and

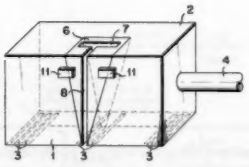
a conductive means for connecting the other ends of each of said wires to said electronic circuit.

4,289,139

ULTRASONIC TRANSDUCER PROBE

Susumu Enjoji, and Koji Saito, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 22, 1979, Ser. No. 14,076
Claims priority, application Japan, Feb. 22, 1978, 53-18534
Int. Cl.³ A61B 10/00
U.S. Cl. 128—660 **12 Claims**



1. An ultrasonic transducer probe for use in injecting a cannula through a region of a subject to be examined comprising:

a carrier with a plurality of ultrasonic transducer elements arranged proximate to an application surface of said carrier adapted to be positioned on the body surface of the subject,

a guide cavity formed in said carrier, said guide cavity extending to said application surface to form an application opening in said application surface proximate to said transducer elements,

a cannula guide block sized to removably and securedly fit within said guide cavity and having at least one guide slot bored therethrough for guiding the cannula, said guide slot communicating with the application opening in said application surface but not communicating with any portion of said carrier itself when said cannula guide block is fit within said guide cavity, and

a slit communicating with said guide slot along its full length and further communicating with the exterior of said carrier to permit the removal of said ultrasonic transducer probe from the subject after a cannula is inserted through said probe and into the body of the subject,

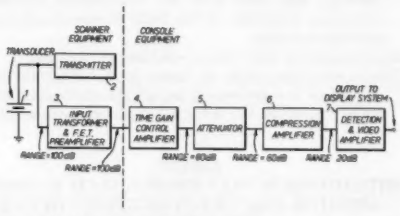
whereby the cannula guide block can be removed from said carrier and sterilized independently of said carrier.

4,289,140

SIGNAL PROCESSING SYSTEM

David A. Carpenter, 44 Bellambi St.; George Kossoff, 38 Lower Cliff Ave., both of Northbridge, 2063, New South Wales, and George D. Radovanovich, 4 Ethie Ave., Beacon Hill, 2100, New South Wales, all of Australia

Continuation-in-part of Ser. No. 903,562, May 8, 1978, abandoned. This application Aug. 31, 1979, Ser. No. 71,098
Claims priority, application Australia, May 6, 1977, PD0005
Int. Cl.³ A61B 10/00
U.S. Cl. 128—660 **5 Claims**



1. In an echoscope including in series:

a transducer to receive echoes of an earlier transmitted non-electrical signal and to convert the received echoes into representative electrical signals;

a time gain compensation amplifier to amplify said electrical signals in dependence upon the relative delay time between transmission of the original non-electrical signal and receipt of the echo; and

compression means to limit the amplitude range of the signals received from the time gain compensation amplifier;

the improvement wherein said compression means comprises:

a plurality of amplitude limiting means connected in series to pass signals applied to the first such means while compressing the amplitudes of those applied signals which exceed a characteristic value for each such means, the electrical parameters of each amplitude limiting means being selected such that the characteristic applied signal amplitude values for the amplitude limiting means are successively smaller,

an adder connected to produce an adder output signal being the sum of adjustable proportions of the output signals from at least the first and last of said series connected amplitude limiting means; and

a switch for selectively producing a final output signal

comprising either an output from said last amplitude limiting means or said adder output signal.

4,289,141

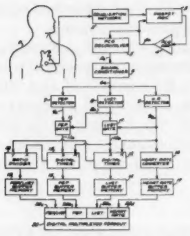
METHOD AND APPARATUS FOR EXTRACTING SYSTOLIC VALVULAR EVENTS FROM HEART SOUNDS

Denny C. Cormier, Miami, Fla., assignor to Cormier Cardiac Systems, Inc., Miami, Fla.

Continuation of Ser. No. 813,248, Jul. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,895, Aug. 19, 1976, Pat. No. 4,094,308. This application Apr. 30, 1979, Ser. No. 34,688

Int. Cl.³ A61B *00/00*

U.S. Cl. 128—713 **9 Claims**



1. A system for deconvolving the phonocardiogram (PCG) to extract the systolic valvular events, SVE(t), from said PCG for determination of the systolic time intervals (STI), comprising:

transducer means for converting heart sounds into an electrical phonocardiogram (PCG), electrical means having a transfer function matching the inverse of the Fourier transformation for the transient response wavelet, TRW(f), associated with the fundamental mechanical-acoustical properties of the heart as transduced by said transducer means

means applying said PCG to said electrical means

further means responsive to signals produced by said electrical means for generating signals corresponding to said SVE(t) to define the temporal boundaries of the STI.

4,289,142

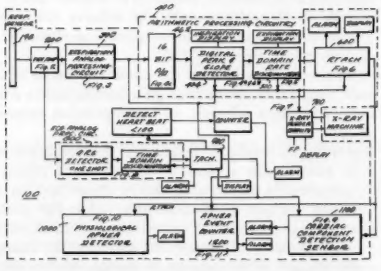
PHYSIOLOGICAL OCCURRENCE, SUCH AS APNEA, MONITOR AND X-RAY TRIGGERING DEVICE

Kenneth L. Kearns, 12822 N. 26th Dr., Phoenix, Ariz. 85029

Filed Nov. 24, 1978, Ser. No. 963,352

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—716 **112 Claims**



1. An apnea monitor comprising:

means, for generating a respiration rate signal indicative of the rate of respiration;

means, for generating a heart rate signal indicative of the rate of heart beats; and

means, responsive to said respiration rate signal and said heart rate signal, for generating an apnea alarm signal when the respiration rate decreases by a predetermined amount in successive periods, and said heart rate decreases in a predetermined number of successive periods.

4,289,143

METHOD OF AND APPARATUS FOR AUDIOMETRICALLY DETERMINING THE ACOUSTIC IMPEDANCE OF A HUMAN EAR

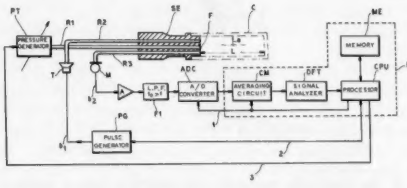
Franco Canavesio, and Rodolfo Ceruti, both of Turin, Italy, assignors to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jan. 9, 1980, Ser. No. 110,801

Claims priority, application Italy, Jan. 12, 1979, 67058 A/79

Int. Cl.³ A61B *5/12*

U.S. Cl. 128—746 **7 Claims**



1. A method of determining the acoustic impedance of a human ear, comprising the steps of:

(a) tightly fitting a channeled probe to a first cylindrical calibrating cavity of radius a_1 and a length L_1;

(b) placing said cavity, via a channel of said probe, under a predetermined static air pressure P_i;

(c) transmitting to said cavity, via a channel of said probe, a short acoustic pulse encompassing a wide spectrum of audible frequencies;

(d) receiving back from said cavity, via another channel of said probe, an acoustic response signal and transforming an electrical wave converted into terms of a Fourier series representing a first set of amplitude samples $S_{1i}(\omega_x)$ of a plurality of constituent frequencies $f_x=\omega_x/2\pi$;

(e) storing the amplitude samples $S_{1i}(\omega_x)$ obtained in step (d);

(f) repeating steps (a) through (e) with said probe fitted to a second cylindrical calibrating cavity of radius a_2 and length L_2, thereby obtaining and storing a second set of amplitude samples $S_{2i}(\omega_x)$;

(g) repeating steps (a) through (d) with said probe fitted to the pinna of a human ear to be tested, thereby detecting a third set of amplitude samples $S_{xi}(\omega_x)$; and

(h) calculating the acoustic impedance $Z_{xi}(\omega_x)$ for said air pressure P_i and for different frequencies f_x from the corresponding stored amplitude samples $S_{1i}(\omega_x)$, $S_{2i}(\omega_x)$, the corresponding detected amplitude samples $S_{xi}(\omega_x)$, the propagation speed v of sound in air, and a fixed parameter γ, according to the following formula:

$$Z_{xi}(\omega_x) = \frac{\gamma P_i}{j\pi v a_1^2} \cot\frac{\omega_x L_1}{v} \cdot \frac{\dfrac{S_{xi}(\omega_x)}{S_{1i}(\omega_x)}\left[\dfrac{S_{1i}(\omega_x)}{S_{2i}(\omega_x)} - 1\right]}{\dfrac{a_2^2 \cot\dfrac{\omega_x L_1}{v}}{a_1^2 \cot\dfrac{\omega_x L_2}{v}} - 1 - \dfrac{S_{xi}(\omega_x)}{S_{1i}(\omega_x)}\left[\dfrac{a_2^2 \cot\dfrac{\omega_x L_1}{v}}{a_1^2 \cot\dfrac{\omega_x L_2}{v}} - \dfrac{S_{1i}(\omega_x)}{S_{2i}(\omega_x)}\right]}$$

4,289,144
A-V SIDEARM LEAD

Byron L. Gilman, Maple Grove, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 10, 1980, Ser. No. 111,049
Int. Cl.[3] A61N *1/04*
U.S. Cl. 128—785 15 Claims

1. Atrial-ventricular sidearm transvenous pacing lead for supplying stimulating signals to an atrium cavity and a ventricular cavity comprising:

a. ventricular lead including first a space-wound coil, insulation covering said first space-wound coil, a ventricular electrode secured to a distal end of said first space-wound coil and a proximal tip secured to a proximal end;

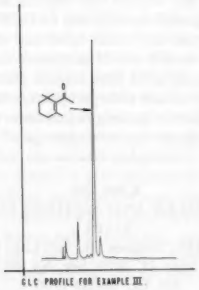
b. atrial lead including a second space-wound coil slideably mounted in coaxial relation over said first space-wound coil and insulation covering said second space-wound coil and a proximal tip secured to the proximal end; and

c. atrial sidearm lead including a space-wound coil having a geometrical memory shape, means connecting said distal end of said sidearm lead to said distal end of said atrial lead, insulation covering said space-wound coil of said lead, and an atrial electrode affixed to a pacing tip of said atrial sidearm lead whereby said ventricle lead coaxially slides within said atrial lead for positioning of said ventricular electrode into said ventricular cavity and said atrial electrode into said atrial cavity.

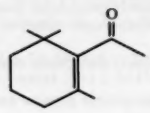
4,289,145
USE OF ACYL TRIMETHYL CYCLOHEXENE DERIVATIVES IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF SMOKING TOBACCO OR SMOKING TOBACCO ARTICLE

Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel; John B. Hall, Rumson; Robin Kasper, Eatontown; Manfred H. Vock, Locust; Ronald Schreck, Keyport; Edward J. Granda, Englishtown, and Joaquin F. Vinals, Red Bank, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 88,451, Oct. 26, 19[illegible], Pat. No. 4,250,332. This application Jun. 5, 1980, Ser. No. 156,647
Int. Cl.[3] A24B *3/12, 15/30*
U.S. Cl. 131—276 3 Claims



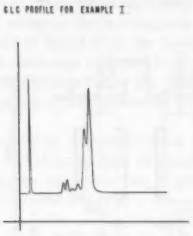
1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to smoking tobacco an organoleptic property modifying amount of the compound having the structure:



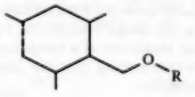
4,289,146
USE OF 2,4,6-TRIMETHYLCYCLOHEXANEMETHANOL AND DERIVATIVES FOR AUGMENTING OR ENHANCING THE AROMA OR TASTE OF SMOKING TOBACCO AND SMOKING TOBACCO ARTICLES

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 82,076, Oct. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Oct. 9, 1980, Ser. No. 195,675
Int. Cl.[3] A24B *3/12*
U.S. Cl. 131—276 3 Claims



1. The process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to smoking tobacco an aroma or taste augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond and R is hydrogen or acetyl.

4,289,147
PROCESS FOR OBTAINING DEPROTEINIZED TOBACCO FREED OF NICOTINE AND GREEN PIGMENT, FOR USE AS A SMOKING PRODUCT

Samuel G. Wildman, Santa Monica, Calif., and Shuh J. Sheen, Lexington, Ky., assignors to Leaf Proteins, Inc., Carson, Calif.

Filed Nov. 15, 1979, Ser. No. 94,584
Int. Cl.[3] A24B *15/20, 15/24, 15/30, 3/14*
U.S. Cl. 131—290 30 Claims

1. A process for treating tobacco leaves to obtain a tobacco product suitable for use in a smoking product from which proteins, nicotine and tar have been removed comprising the steps:

(a) converting the leaves to a pulp comprising a mixture of a coarse solid material portion and a liquid portion, the

liquid portion containing water-soluble plant material and a suspension of finely particulate material;
(b) separating the coarse solid material from the liquid portion;
(c) separating the finely particulate material from the liquid portion;
(d) separating water-soluble protein and nicotine from said liquid portion;
(e) separating pigmented material from said coarse solid material and said finely particulate material;
(f) separating green pigmented components of said pigmented material from non-green pigmented components; and
(g) recombining the depigmented coarse solid material, the liquid portion from which protein and nicotine have been removed and the non-green pigmented components.

4,289,148

PROCESS FOR IMPROVING THE FILLING CAPACITY OF TOBACCO

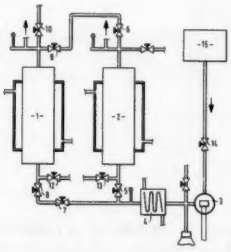
Klaus-Dieter Ziehn, Hunnenbarg 19, D-2080 Pinneberg, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,382

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903300

Int. Cl.[3] **A24B** *3/18*

U.S. Cl. 131—291 **15 Claims**



1. In a process for improving the filling capacity of tobacco comprising treating the tobacco with gas under pressure and subsequent heating after relief of the pressure, the improvement comprising treating the tobacco with nitrogen or argon at a working pressure between 300 and 1000 bar and at a working temperature in the range 0° to 50° C. followed, after pressure relief, by brief treatment at a temperature of 100° to 400° C. or by microwave heating thereby improving the filling capacity of the tobacco.

4,289,149

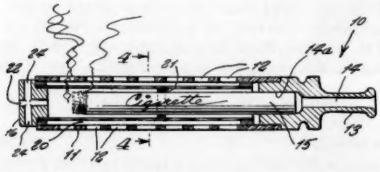
CIGARETTE PROTECTOR

George S. Kyriakou, 43-43 91st Pl., Elmhurst, N.Y. 11373

Filed Apr. 2, 1980, Ser. No. 136,521

Int. Cl.[3] **A24F** *7/02*

U.S. Cl. 131—175 **1 Claim**



1. A cigarette protector comprising an elongated inner tube having a series of perforations formed on the surface thereof and defining therein a hollow elongated cavity for reception therein of a cigarette, said perforations being in fluid communication with said hollow cavity, said inner tube having a first end and a second end spaced longitudinally from said first end; an outer elongated tube also having a series of perforations formed on the surface thereof and defining an elongated hollow cavity therein, said elongated outer tube having a diameter greater than the diameter of said inner tube for receiving therein said inner tube, said outer tube having a longitudinal length greater than the longitudinal length of said inner tube, said outer tube having a first end near said first end of said inner tube but spaced therefrom in a direction away from said second end of said inner tube, and a second end axially aligned with and coplanar with said second end of said inner tube, whereby when said inner tube is mounted within said outer tube, a hollow space exists between said first end of said inner tube and said first end of said outer tube which is defined by the inner surface of said outer tube; said inner tube having a pair of spacer collars, one said spacer collar being mounted at said first end of said inner tube, and the other of said spacer collars being mounted at said second end of said inner tube, whereby said inner tube is spaced from and aligned with said outer tube, said pair of spacer collars bearing against the inner circumferential surface of said outer tube; said inner tube further comprising an inner ring projecting from the inner circumferential surface of said inner tube and projecting into said hollow elongated cavity of said inner tube for positioning therein in a stable and firm manner a cigarette, said ring being positioned midway between said first and second ends of said inner tube; a mouthpiece having an elongated first portion having an axial opening formed therein, and a second portion of larger diameter than said first portion, said opening formed in said first portion extending part way into said second portion, said second portion also having formed therein an axial opening of larger diameter than said opening in said first portion, said second portion having a reduced end forming thereabout a shoulder for abuttment against said first end of said outer tube, said reduced portion having an outer diameter approximately equal to the inner diameter of said outer tube for snugly fitting said second portion of said mouthpiece in said first end of said outer tube, said larger diameter opening of said second portion receiving therein the end of a cigaretter adjacent said first end of said outer tube, said axial opening of larger diameter of said second portion extending from a first location within said hollow space between and spaced from said first ends of said inner and outer tubes and a second location beyond said first end of said outer tube in a direction away from the second end thereof; and a removable end cap mounted at said second end of said inner tube, said removable cap having an enlarged portion formed with an axial bore and a plurality of radial bores, and a reduced portion of smaller diameter than said enlarged portion to define therebetween a shoulder portion, said reduced portion fitting snugly within said hollow cavity of said inner tube at said second end thereof, and said shoulder portion abutting against the outward end surfaces of said second ends of said inner and outer tubes and said spacer collar positioned at said second end of said inner tube, said reduced portion also having an axial bore formed therein in alignment with said axial bore of said enlarged portion of said removable cap, whereby a cigarette burning in said inner tube is protected from causing damage to the surroundings.

4,289,150

PROTECTIVE COVER AND METHOD FOR TREATING HAIR

David D. Kimball, 4677 Wallace La., Salt Lake City, Utah 84117

Filed May 21, 1979, Ser. No. 40,798

Int. Cl.[3] **A45D** *7/00*

U.S. Cl. 132—7 **17 Claims**

1. A protective cover for use in dyeing selected locks of hair of a patron while shielding the remaining portion of hair from the liquid dye applied to said locks of hair, said protective cover comprising:

an outer layer fabricated from material adapted to absorb excess liquid dye that may be applied to said locks of hair;

a liquid impervious liner adapter to be placed adjacent the scalp of a patron, said liner and outer layer being fabricated from materials that are easily punctured to permit withdrawal of said locks of hair through the points of

puncture, and said liner and outer layers being joined together and supplied as an essentially flat piece of material that may be folded or cut to fit the scalp of a patron;

adhesive tabs for securing the folds of said protective cover once it has been folded to fit the scalp of a patron; and

pre-printed indicia placed on said protective cover as a guide to folding or cutting the cover.

4,289,151

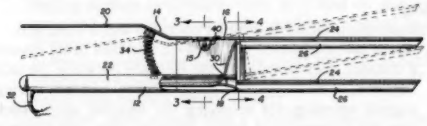
TWIN CURLING IRON

Jessie M. Pope, 3300 West Warren, Detroit, Mich. 48208

Filed Jun. 29, 1979, Ser. No. 53,175

Int. Cl.³ A45D *2/24*

U.S. Cl. 132—37 R **3 Claims**



1. A twin curling iron including a pair of elongated levers pivotally connected intermediate their opposite ends and defining first and second pairs of corresponding lever ends, said first pair of lever ends each including a pair of generally parallel end portions spaced apart and disposed in a single plane generally paralleling the longitudinal extent of the corresponding levers, a first pair of said end portions defining elongated channel members opening laterally in the same direction paralleling said plane with a first channel member opening toward the second and the second opening away from the first channel member, the other pair of said end portions defining elongated presser members seated in said channel members with one of said presser members disposed between said channel members and said second channel member disposed between said presser members, said levers being relatively pivotable to laterally swing said presser members in said plane outwardly of said channel members and the spacing between said channel members being sufficient to enable said one presser member to be swung outwardly of the corresponding channel member without contacting the other channel member, one pair of said end portions having electrical resistance heating means operatively associated therewith for heating said one pair of end portions.

4,289,152

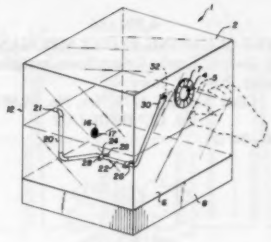
NAIL CLEANER

Leo M. Fuhre, 6905 Arcola St., Burnaby, British Columbia, Canada (V5E 1H5)

Filed May 24, 1979, Ser. No. 42,381

Int. Cl.³ A45D *29/17*; A61H *35/00*

U.S. Cl. 132—74.5 **6 Claims**



1. A fingernail cleaning apparatus comprising:

a housing with a bottom and an aperture above the bottom for inserting a finger;

a pump mounted on the housing having an intake port connecting the pump to the housing near the bottom thereof for the intake of liquid from the housing and a discharge port for the discharge of liquid from the pump;

a nozzle member connected to the discharge port having a discharge orifice located inwardly from the housing aperture; and

a pointed projection disposed within the orifice oriented generally parallel to the flow of liquid through the orifice for pushing the skin near the fingertip away from the fingernail when the fingertip is pressed against the nozzle member to provide access for liquid issuing from the orifice to a space behind the fingernail without affecting the directionality of liquid issuing from the orifice so as to affect a complete cleaning of the space.

4,289,153

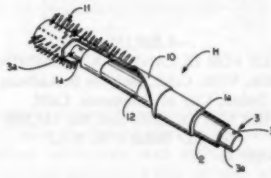
HAIR STYLING DEVICE

Anthony Paccione, 1681 65th St., Brooklyn, N.Y. 11204

Continuation-in-part of Ser. No. 930,024, Aug. 21, 1978, abandoned. This application May 28, 1980, Ser. No. 153,972

Int. Cl.³ A45D *44/18*

U.S. Cl. 132—85 **2 Claims**



1. A hair styling device comprising, an elongated handle member having a rigid hollow body divided into two chambers by a common end wall for storage of two kinds of liquid therein, said hollow body being open at longitudinally opposed ends thereof, each of said open ends communicating with a respective one of said chambers for permitting said chambers each to be charged with liquid, two cap members detachably fastened to said respective open ends of the hollow body, said cap members each having therein pump and nozzle assemblies for selectively spraying liquid from the chambers, and a hair manipulative member including an elongated hollow casing and bristles attached to the casing and extending outwardly

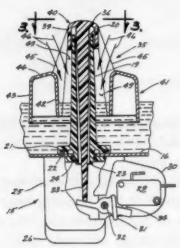
therefrom, said hollow casing having at least one opening at a longitudinal end adapted for receiving therethrough either one of said two chambers of said handle member to be snugly and firmly engaged therewith, so that one of the chambers of the handle member is exchangably situated in the hair manipulative member and the other chamber extending outwardly therefrom is used as a handle of the device.

4,289,154

SELF-CLEANING FLOAT MECHANISM

Lawrence L. Quayle, Lambs Grove, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Nov. 29, 1979, Ser. No. 98,601
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—56 D **9 Claims**



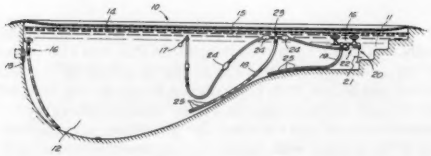
1. A liquid level control device for a washing apparatus having a liquid container including a bottom wall and means within said container for spraying liquid, the combination comprising: a standpipe extending generally vertically from said bottom wall and having an open upper end disposed above the liquid operating level and a lower end providing an opening through said bottom wall; liquid supply control means outside said container including actuating means adjacent the lower end of said standpipe; and vertically movable control means operably associated with said standpipe and including a buoyant portion radially spaced from said standpipe, a cap portion axially spaced above said buoyant portion and enclosing the open upper end of said standpipe to prevent entry of spraying liquid thereinto, angularly spaced means for interconnecting said buoyant portion and said cap portion in said axially spaced apart relationship and defining an open area therebetween to permit spraying liquid to flow therethrough, and an elongated stem portion extending downwardly from said cap portion and through said standpipe for engagement with said actuating means.

4,289,155

APPARATUS FOR CLEANING A SWIMMING POOL

Chester A. Sable, Vista, Calif., assignor to Anthony Pools, Div. of Anthony Indus., City of Commerce, Calif.

Filed May 11, 1980, Ser. No. 145,589
Int. Cl.³ B08B *9/08, 3/02*
U.S. Cl. 134—167 R **5 Claims**



1. In apparatus for cleaning a swimming pool including a flexible conduit connected to a source of pressurized water, one or more hoses connected to said conduit, means powered by the pressurized water to drive the hoses about the pool, and float means for supporting the drive means, hoses and conduit in the water, the improvement comprising:

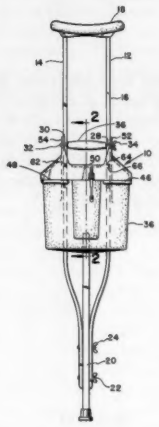
the float means includes a float member of selectively variable buoyancy that is adjusted to such buoyancy as to locate the hoses, drive means, conduit and float means below the upper surface of the pool water.

4,289,156

CRUTCH ATTACHMENT

George Ulics, 1300 Venice, Dearborn, Mich. 48124

Filed Sep. 10, 1979, Ser. No. 73,912
Int. Cl.³ A45B *1/00;* **A61H** *3/02*
U.S. Cl. 135—66 **7 Claims**



1. For use with a crutch having a pair of spaced side rails, a handle disposed between said side rails at right angles thereto, elongated fastener means passing through said handle and having its ends supported on said side rails, a container comprising:

compartment means having an open top and a wall; and

a pair of tabs connected to said wall, said tabs being spaced a distance accommodating the distance between the side rails so as to be disposed adjacent thereto, said tabs having aligned openings for receiving the fastener means such that the compartment means depends from said fastener means; and

in which the side rails have a first pair of aligned openings receiving the fastener means, and a second pair of openings suited for receiving the fastener means to adjust the position of the handle on the side rails, and including tooth means integrally carried on the tabs and receivable in the second pair of openings to cooperate with the fastener means in preventing motion of the container with respect to the crutch side rails.

4,289,157

VALVE WITH HEAT-RESPONSIVE BEARING ASSEMBLY PROVIDING BACK SEAT ARRANGEMENT

John K. McGee, Houston, Tex., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 28, 1979, Ser. No. 79,953
Int. Cl.³ F16K *41/02, 17/38*
U.S. Cl. 137—72 **3 Claims**

1. For a normally non-rising stem valve having a valve stem which passes out of a chamber in a valve housing through a bonnet having a passageway in which a packing assembly normally seals between the valve stem and the bonnet and in which a bearing assembly journals the valve stem for rotation

relative to the bonnet and a retainer means secures the bearing assembly relative to the bonnet against substantial axial movement of said valve stem and of said bearing assembly,

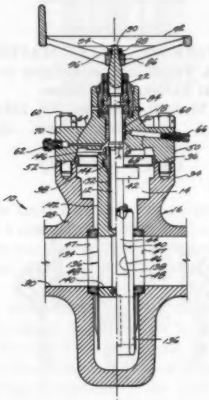
the improvement wherein:

the retaining means includes a bonnet gland secured to said bonnet and surrounding the bearing assembly;

the retaining means further includes a retainer secured to the bonnet gland relatively exteriorly of the bearing assembly; and

the retaining means further includes a body of relatively low temperature fusible material physically axially interposed between said retainer and the bearing assembly, said body being in the form of a washer-like annulus;

said improvement further comprising channel means out through which said fusible material may run when subjected to a predetermined amount of relatively low temperature heat, so that when the fusible material has run out, the valve stem is free to rise to a limited extent; and



said improvement further comprises an annular first metal sealing surface circumferentially provided on said valve stem and a second metal sealing surface provided on said bonnet within said chamber, which two sealing surfaces normally remain spaced axially apart but which become annularly engaged in a sealed condition upon rising of said valve stem by said limited extent;

the bonnet gland comprising a tubular member having an internally threaded outer end portion and said retainer comprising an externally threaded tubular retaining gland threaded into the outer end portion of the bonnet gland;

said valve stem including a radially outwardly projecting flange and said bearing assembly including a first bearing ring below and in contact with that flange and a second bearing ring above and in contact with that flange; and

a tubular spacer means interposed between the second bearing ring and the annulus of fusible material.

4,289,158

SUCTION CONTROL APPARATUS

John R. Nehring, Woodcliff Lake, N.J., assignor to C. R. Bard, Inc., Murry Hill, N.J.

Division of Ser. No. 722,099, Sep. 10, 1976, abandoned. This application Mar. 5, 1979, Ser. No. 17,616

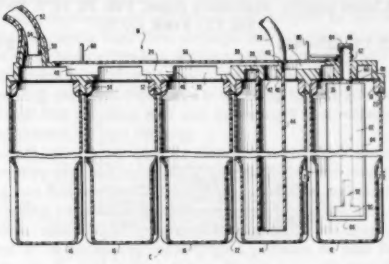
Int. Cl.[3] A61M *1/00*

U.S. Cl. 137—205 **21 Claims**

1. A suction control apparatus comprising:

a suction control container adapted to receive a predetermined quantity of liquid thereby defining an air chamber above the level of liquid therein, said air chamber being in fluid communication with a vacuum source; and

a passage for communicating atmospheric air external to said apparatus into said suction control container to a location below the level of liquid in said container, said air flowing from said location into said air chamber of said suction control container for controlling the negative pressure of said vacuum source; said passage including means for reducing the loss of liquid from said suction control con-



tainer due to liquid entrainment in the air flowing through the container and for attenuating noise in said suction control apparatus, said latter means including means for transmitting said atmospheric air into said air chamber without contact with the liquid in the suction control container during said transmission of air.

4,289,159

OUTLET VALVE FOR A GAS COMPRESSOR

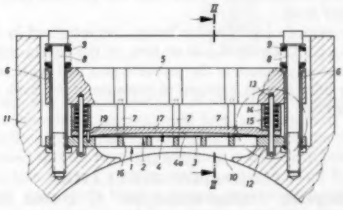
Horst Ehemann, Neuenstadt, and Max Ruf, Neckarsulm, both of Fed. Rep. of Germany, assignors to Audi NSU Auto Union, Neckarsulm, Fed. Rep. of Germany

Filed Oct. 4, 1979, Ser. No. 81,828

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2849075

Int. Cl.[3] F16K *15/16*

U.S. Cl. 137—454.4 **2 Claims**



1. A compressor having a housing and an outlet valve which comprises: a valve seat having through apertures for working fluid; a resilient valve plate with spring closing tongues to cover said through apertures; a limit member which limits the lift of the valve plate and is curved concavely on a side thereof which faces the valve plate and which has apertures offset with respect to said through apertures; first spring means for resiliently urging the valve seat against an abutment face on the housing; a pressure member arranged between the first spring means and the limit member; first spacer means between the pressure member and the valve seat to fix the distance therebetween; second spring means between the pressure member and the limit member to urge the ends of the valve plate against the valve seat, at least one of said ends being movably mounted between the valve seat and the limit member; and second spacer means between the pressure member and the limit member to limit the lift of the latter relative to the valve seat to a fraction of a millimeter.

4,289,160

PRESSURE CONTROL VALVE

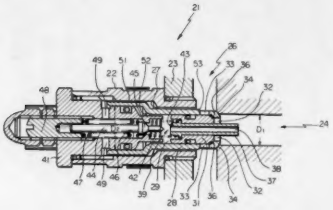
Haruhiko Kawasaki, Sagamihara; Hideshi Koiwai, Toda, and Shizuo Matsumura, Konosu, all of Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1980, Ser. No. 121,609

Claims priority, application Japan, Feb. 20, 1979, 54-19567

Int. Cl.³ F16K *17/18*

U.S. Cl. 137—491 **5 Claims**



1. A pressure control valve including:

a housing defining a pressure port, a relief port and a back pressure chamber;

a relief poppet biased to block communication between the pressure port and the relief port, a first end of the relief poppet communicating with the pressure port and a second end of the relief poppet communicating with the back pressure chamber;

a piston poppet formed with a bore and slidably extending through the relief poppet; and

a pilot poppet biased to block communication between the back pressure chamber and the relief port, the pilot poppet being moved when a pressure in the back pressure chamber is above a biasing force to unblock communication between the back pressure chamber and the relief port, the piston poppet being moved by a pressure difference between the pressure port and the back pressure chamber to abut against the pilot poppet and seal the bore, the relief poppet being moved by said pressure difference to unblock communication between the pressure port and the relief port;

the pressure control valve being characterized in that $A_P/A_R \geqq 1.1$ where A_R is an area of the piston poppet exposed to pressure in the pressure port and A_P is an area of the pilot poppet exposed to pressure in the back pressure chamber.

4,289,161

FLUID FLOW REGULATOR

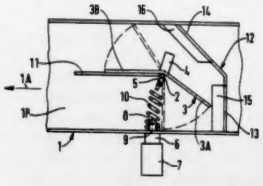
Emil Siegwart, Michael-Blatter-Str. 6, D-6603 Sulzbach-Neuweiler, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,562

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758352

Int. Cl.³ G05D *7/01*

U.S. Cl. 137—499 **17 Claims**



1. A fluid flow regulator, comprising a tubular housing defining a passage for the flow of a fluid medium in a predetermined direction; shaft means mounted in said housing and defining a pivot axis extending substantially diametrically of said passage; a valving element mounted on said shaft means in said passage, said element including two mutually inclined sections and being turnable by the fluid medium between spaced apart first and second end positions in which said element respectively permits and prevents the flow of fluid medium through said passage, one of said sections being substantially parallel to the axis of said housing in one end position and the other of said sections being substantially normal to the axis of said housing in the other end position of said valving element; and means for restricting the flow of fluid medium in said passage upstream of said valving element, as considered in said direction, said flow restricting means defining at least one channel whose cross-sectional area is less than the cross-sectional area of said passage and which directs at least one stream of fluid medium against said valving element.

4,289,162

FLUID RESERVOIR FOR BRAKE MASTER CYLINDER

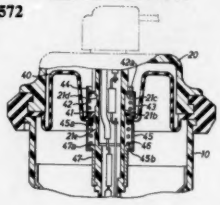
Yoshihisa Nomura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 28, 1980, Ser. No. 135,096

Claims priority, application Japan, Jun. 29, 1979, 54/90579[U]

Int. Cl.³ F15B *7/10*

U.S. Cl. 137—572 **5 Claims**



1. A fluid reservoir for mounting on a brake master cylinder, the reservoir comprising:

a casing for storing an amount of brake fluid therein, said casing having an upper opening;

a cap detachably coupled over the upper opening of said casing to close said casing, said cap being provided at the center thereof with a vertical rod extending axially into said casing and having a pair of axially spaced recesses at its intermediate portion;

an extendable diaphragm seal member coupled in a fluid-tight manner within said casing to subdivide the interior space of said casing into an upper chamber vented through a portion of said cap and a lower chamber located above the liquid surface of the brake fluid, said diaphragm seal member being provided at its inner periphery with an annular valve part movable along the intermediate portion of said vertical rod and cooperating with the recesses of said rod to permit the flow of air to and from the lower chamber;

resilient means for normally retaining the valve part of said diaphragm seal member between the recesses of said rod to close the lower chamber wherein said resilient means comprises first and second coil springs concentrically assembled with said vertical rod, said first spring being loaded to bias the valve part of said diaphragm seal member in the downward direction, and said second spring being loaded to bias the valve part of said diaphragm seal member in the upward direction; and

a cylindrical spring receiver concentrically assembled with said vertical rod to contain said first spring therein and secured at its lower end to the valve part of said diaphragm seal member, and an annular retainer engaged with a stepped portion of said vertical rod and received by

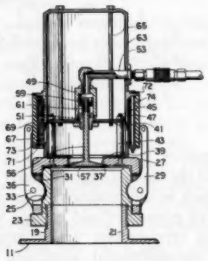
an upper end portion of said receiver in such a manner that upward movement of said receiver is guided by said retainer, and wherein said first spring is disposed with a predetermined load between the lower end of said receiver and said retainer.

4,289,163

VENT VALVE FOR A MOBILE TANK

Leslie E. Pierson, 3629 Layton, Haltom City, Tex. 76117

Filed May 21, 1979, Ser. No. 40,749
Int. Cl.³ F16K *24/00, 35/00*
U.S. Cl. 137—587 **5 Claims**



1. In a mobile tank for transporting liquids, having a discharge port and a manually operable discharge valve adjacent its bottom for discharging liquid, an improved means to reduce negative pressure in the tank while unloading the liquid, comprising;

valve means, mounted to the tank adjacent its top in an aperture, having an open position for communicating the interior of the tank with the exterior, and a closed position for closing the aperture; the valve means having a valve seat separating the interior of the tank from the exterior and a reciprocal valve head carried on the interior side of the valve seat for seating against the valve seat when the valve means is in the closed position;

a manually operable air valve mounted in a line extending from a source of air pressure to the valve means, the valve means being responsive to said air pressure for moving from the closed position to the open position;

said manually operable air valve having a handle that is movable from a closed position to an open position for selectively supplying said air pressure to the valve means; and

mounting means for mounting the air valve to the tank so that the air valve handle physically interferes with coacting handle means on said discharge valve during the opening movement of the discharge valve when the air valve is in said closed position preventing said discharge valve from opening, said air valve handle movable to a position when said air valve is moved towards said open position such that said air valve handle no longer interfers with said discharge handle means to allow said discharge valve to be moved to the open position.

4,289,164

COUPLING DEVICE

Kjell R. Ekman, Zug, Switzerland, assignor to Ekman Engineering AG, Zug, Switzerland

Continuation-in-part of Ser. No. 884,668, Mar. 8, 1978, Pat. No. 4,219,048, which is a continuation-in-part of Ser. No. 691,105, May 28, 1976, abandoned. This application Apr. 18, 1980, Ser. No. 141,734
Int. Cl.³ F16L *37/28*
U.S. Cl. 137—614.03 **21 Claims**

1. A coupling device for supplying fluid from a pressurized source to an output conduit without fluid leakage, said coupling device comprising:

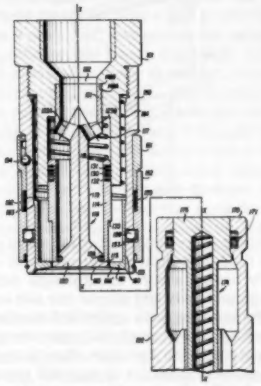
a first coupling part having a flow passageway extending therethrough;

a second coupling part having a further flow passageway extending therethrough, said flow passageways forming a continuous flow passageway through said coupling device as said coupling parts are detachably coupled to one another to permit fluid flow through said coupling device;

a first valve body extending within said first coupling part in a direction parallel to a longitudinal axis through said first coupling part, said first valve body being fixedly attached to said first coupling part and including a first, enlarged end portion formed thereon;

a second valve body slidably disposed within said second coupling part and including a second end portion contacting said first, enlarged end portion as said first and second coupling parts are detachably coupled to one another;

a hollow casing slidably arranged within said first coupling part so as to selectively surround portions of said first valve body, said hollow casing including a cylindrically-shaped surface portion perpendicularly spaced from said longitudinal axis a distance which is less than a perpendicular distance between a side surface of a flange mounted on said first, enlarged end portion and said longitudinal axis, providing for selective contact between said hollow



casing and said side surface of said flange to block fluid flow completely through said first coupling part;

said hollow casing further including an outer surface having a raised surface portion extending in a radially outwardly direction toward a surrounding portion of said first coupling part, with biasing means positioned between an interior portion of said first coupling part and a portion of said hollow casing for biasing said hollow casing into surface contact with said side surface of said flange;

said coupling device further including a cover assembly slidably disposed within said first coupling part and encircling said casing, said cover assembly including an elongated flange extending in a radially inwardly direction from a first end of said cover surrounding said first, enlarged end portion, said cover assembly further including a second end axially spaced from said first, enlarged end portion;

said elongated flange having an inner end surface spaced from said longitudinal axis a perpendicular distance less than a perpendicular distance between said raised surface portion and said longitudinal axis, said elongated flange further including a first side wall portion facing said raised surface portion and extending in a direction substantially perpendicular to said longitudinal axis and said elongated flange including a second side wall surface facing away from said raised surface and inclined toward said first side

surface as the distance towards said inner end surface decreases; and said coupling device includes

further biasing means extending between an interior wall portion of said first coupling part and said second end of said cover member for biasing said elongated flange into a position radially aligned with said flange mounted on said first, enlarged end portion;

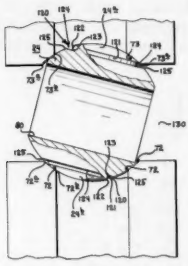
whereby said second coupling part contacts and presses said elongated flange toward said further biasing means as said coupling parts are detachably coupled to one another, with said elongated flange contacting said raised surface portion of said hollow casing to slide said hollow casing out of contact with said first, enlarged end portion to allow fluid flow through said first coupling part.

4,289,165

EQUALIZING BALL VALVE MEMBER

John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 17, 1979, Ser. No. 39,836
Int. Cl.³ F16K *13/22*
U.S. Cl. 137—625.32 **27 Claims**



1. An equalizing ball valve member for use in valve apparatus to control fluid flow through said apparatus comprising: a spherical body having a bore therethrough defining a flow passage through said body and at least one side sealing surface on said body for coacting with a spherical annular seat surface for permitting fluid flow through said apparatus when said ball valve member is rotated to a position aligning said bore within said annular seat surface and for closing said apparatus to fluid flow when said ball valve member is rotated to a position at which said bore is misaligned from said annular seat surface and said side sealing surface on said ball valve member is engaged with said annular seat surface; and said spherical body being provided with equalizing flow course means on said side sealing surface over an area smaller than the area within the inner edge of said annular seat surface to permit limited fluid flow past said valve member while remaining in intimate contact with said annular seat surface at a position of rotation of said valve member between a closed position and prior to rotation of said ball valve member to a position at which said bore communicates through said annular seat surface.

4,289,166

CLOG-PROOF CHECK VALVE

Harold R. Haines, Utica, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

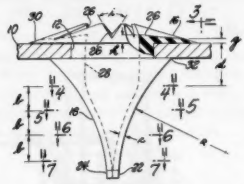
Filed Nov. 5, 1979, Ser. No. 91,426
Int. Cl.³ F16K *15/14*
U.S. Cl. 137—846 **7 Claims**

1. A clog-resistant drain valve of soft elastomeric material formed integrally with a stem and an enlarged head in a shape resembling a mushroom;

a. the stem of the valve in its elastomeric free state tapering at a lower end to an elongated flat edge;

b. the head of the valve having a peripheral groove adapted to receive the edges of an opening in a surface to be drained by the valve;

c. a substantially vertical drain passage centered and originating in the head in substantially circular cross-sectional form, and in the free state terminating at the tapered lower end in a generally flat edge; said drain passage in said preformed free state being progressively larger in overall perimeter commencing from the beginning of the taper and going towards said terminal lower flat edge;



d. the elastomeric material being sufficiently soft to permit opening of the tapered edge for ready passage of entrained solids which would otherwise clog the drain; and

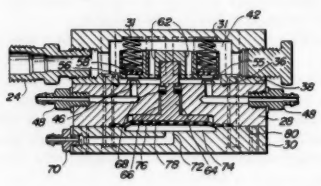
e. the tapered portion of said passage when open having a preformed cross-section which progressively increases without circumferential stretching as drained refuse moves toward and passes through the extreme lower edge.

4,289,167

NON-DRIP FLUID DELIVERY SYSTEM

Thomas G. Switall, Wheeling, Ill., assignor to Ryco Graphic Manufacturing, Inc., Wheeling, Ill.

Continuation of Ser. No. 955,977, Oct. 30, 1978, abandoned.
This application Aug. 25, 1980, Ser. No. 180,858
Int. Cl.³ F16K *11/04*
U.S. Cl. 137—869 **2 Claims**



2. A non-drip fluid delivery system, comprising:

(a) a supply of fluid under pressure;

(b) a plurality of outlet lines;

(c) a single valve means for said plurality of outlet lines for simultaneously interrupting the flow of fluid from said supply to each of the outlet lines, said valve means including;

(1) a valve body having a top and bottom, a cylindrical chamber therein, said chamber being closed at the top of the body and open at the bottom of the body, and means for introducing the supply of fluid into said chamber;

(2) a valve manifold securely mounted to the bottom of said valve body for closing the open end of the cylindrical chamber and defining therewith a valve cylinder, said manifold including a through orifice in communication with the cylinder, a plurality of outlet channels being disposed in said manifold in communication with said valve cylinder, said channels being in one-to-one corresponding communication with the plurality of outlet lines;

(3) sealing means disposed intermediately of the valve body and valve manifold;

(4) a single piston disposed in said cylinder intermediate of the means for introducing the fluid supply and the outlet channels and movable between a first position and a second position in said cylinder, said valve piston when in first position being in simultaneous closing engagement with each of said outlet lines and when in said second position being out of engagement with the outlet lines to permit the flow of fluid from said supply into each of the outlet lines; and

(5) a valve plunger extending through said valve manifold through orifice and positioned for operative engagement with said piston;

(d) valve operating means for selectively moving said piston between its first position and second position for simultaneously opening and closing all of said outlet lines, said valve operating means comprising:

(1) a valve control cover having a recess, and being securely mounted to said valve manifold such that said annular recess faces said valve manifold;

(2) a diaphragm disposed in said annular recess; and

(3) means for selectively supplying air under pressure to said diaphragm, the diaphragm being responsive to air pressure applied there against for displacing the valve plunger and moving the valve piston from the first position to the second position.

4,289,168

METHOD FOR MAKING PIPE OF FABRIC IMPREGNATED WITH RESIN

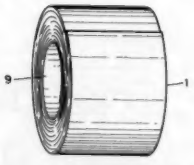
Guy B. E. Lecourt, Massy, France, and Claude L. L. Portalier, Marly Le Roi, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Sep. 17, 1979, Ser. No. 75,997

Claims priority, application France, Sep. 22, 1978, 78 27205

Int. Cl.³ F16L *9/16;* B29D *23/12;* B23D *23/13*

U.S. Cl. 138—109 **10 Claims**



1. A method for making a tubular hollow body from fabric impregnated with a thermosetting resin, comprising:

forming a coil of dry, thermosetting resin impregnated fabric, inserting the coil into a hollow mold having two open ends, inserting a preheated mandrel into the coil through a first of said open ends, said mandrel having a conical portion and a cylindrical portion, causing turns of the coil to shift axially and form a conical shape larger than said coil as initially inserted in said mold, inserting a presser sleeve into the mold through the second open end, said sleeve surrounding said cylindrical portion and cooperating with said mandrel and said hollow mold to exert pressure on said coil and to shape said coil while maintaining the temperature of the coil above the softening point of the resin but below a temperature at which significant further polymerization will occur, and then further polymerizing said resin.

4,289,169

HEAT-EXPANDABLE MULTI-PASSAGE PIPE HAVING PARTS FOR INTENDED BREAKAGE

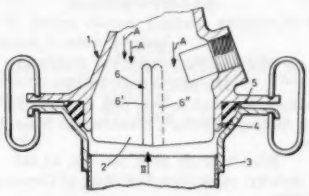
Detlef Banholzer, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 95,934

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916030

Int. Cl.³ D03D *13/00;* F01N *7/00;* F28F *7/00;* B65D *65/28*

U.S. Cl. 138—117 **3 Claims**



1. In a heat-expandable tube-like component including a tubular wall having a length dimension and defining an inner space; and a septum attached to the tubular wall and dividing the inner space into separate, longitudinally extending passages; the improvement wherein said septum has a weakened portion comprising means defining a first groove-like recess in one face of said septum; said first groove-like recess extending substantially parallel to said length dimension; and means defining a second groove-like recess in another, opposite face of said septum; said second groove-like recess extending slightly offset from and parallel to said first groove-like recess; further wherein portions of said septum flanked by said first and second groove-like recesses are sufficiently weak to break under the effect of forces derived from heat-caused expansion of said component; and further wherein said recesses being so arranged with respect to one another that upon breakage of the septum portions flanked by said recesses the septum halves obtained by the breakage are adapted to glide past one another.

4,289,170

COMPONENT SUBJECTED TO THERMAL STRESSES AND HAVING PARTS FOR INTENDED BREAKAGE

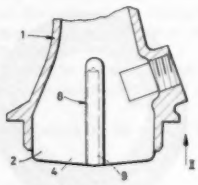
Karl Pape, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 95,935

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1978, 2850614

Int. Cl.³ D03D *13/00;* F01N *7/00;* F28F *7/00;* B65D *65/28*

U.S. Cl. 138—117 **4 Claims**



1. In a wall-like component being supported at opposite ends and exposed to thermal stresses, the improvement comprising

(a) an elongated bilateral enlargement extending substantially parallel to a plane in which the component lies; said enlargement being oriented substantially perpendicularly to an imaginary distance line between said opposite ends;

(b) means defining an elongated cavity extending within and codirectionally with said enlargement; said cavity being offset with respect to said enlargement in the direction of one of said ends of said component; said cavity having a

dimension measured in a direction perpendicular to said plane; said dimension being greater than the thickness of a component portion adjoining said enlargement, whereby upon breakage of parts of said enlargement under the effect of forces derived from heat-caused expansion of the component, there being obtained a free edge of said component portion and a trough-like part formed together by remaining parts of said enlargement and said cavity for receiving said free edge.

4,289,171

TUBULAR PACKAGING SHEATH AND PROCESS FOR ITS MANUFACTURE

Felix Rassbach, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,103

Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2822886

Int. Cl.[3] **F16L** *11/02;* **B32B** *1/08*

U.S. Cl. 138—145 **16 Claims**

1. A packaging material, comprising a fibrous web wherein at least a part of the fibers forming said base web include at least a partial coating of a mixture of chemical substances which comprise a major proportion by weight of a chemical binder based on a synthetic water-soluble heat-curable cationic resin precondensate and of a minor proportion by weight of at least one coloring chemical substance, and a layer of regenerated cellulose impregnating and coating said fibrous base web which is at least partially coated with said mixture of chemical substances, said packaging material being produced by a method comprising the steps of applying to at least one surface of said fibrous web a liquid containing a solids constituent comprised of said mixture of chemical substances, removing the liquid volatile constituent of said liquid, thereafter impregnating and coating the fibrous web with a viscose solution, and regenerating said viscose to produce said regenerated cellulose impregnated and coated fibrous web.

4,289,172

REINFORCED BITUMEN PIPES AND PROCESS FOR THEIR MANUFACTURE

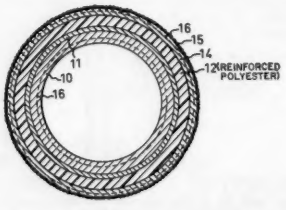
Stig O. M. Ekström, Kungsgatan 28, S-211 49 Malmö, Sweden

Filed May 1, 1979, Ser. No. 34,884

Claims priority, application Sweden, May 31, 1978, 7806324

Int. Cl.[3] **F16L** *9/14*

U.S. Cl. 138—149 **12 Claims**



1. A reinforced bitumen pipe, characterized in that it has an insulating glass fiber layer which on its inner side is united with an inner bitumen layer partially penetrating into the glass fiber layer and which on its outer side is united with a strength-providing layer of reinforced thermosetting resin partially penetrating into the glass fiber layer without reaching the bitumen layer, said strength-providing layer being coated on its outer side with an outer bitumen layer.

4,289,173

PAPERMAKERS FABRICS

Terence Miller, Chorley, England, assignor to Scapa-Porritt Limited, Blackburn, England

Continuation of Ser. No. 871,460, Jan. 23, 1978, which is a continuation of Ser. No. 735,986, Oct. 27, 1976, abandoned. This application Jan. 21, 1980, Ser. No. 109,661

Claims priority, application United Kingdom, Oct. 30, 1975, 44800/75

Int. Cl.[3] **D03D** *23/00*

U.S. Cl. 139—383 A **7 Claims**

1. A single layer forming fabric for supporting and draining water from a water laden web of cellulosic fibers in the wet end of a papermaking machine having a wet end and a dryer end, said fabric comprising: in at least one of the machine and cross-machine directions, first common direction yarns formed wholly from polyester material so as to impart dimensional stability in at least the or each direction in which said yarns extend, said woven structure also including further common direction yarns extending essentially parallel and lying in substantially the same plane with said first yarns, said further yarns being formed wholly from a synthetic material different from and of greater wear resistance than said polyester material of said first yarns, said first and further yarns being arranged adjacently in an alternating relationship throughout the fabric.

4,289,174

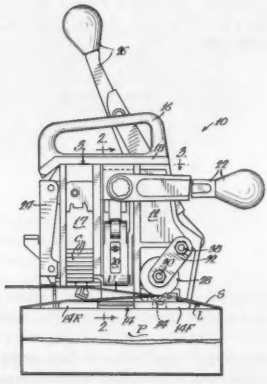
POSITIVE SEALING ASSEMBLY FOR HAND OPERATED STRAPPING TOOL

Robert J. Massion, Cary, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Sep. 24, 1979, Ser. No. 77,940

Int. Cl.[3] **B21F** *9/02*

U.S. Cl. 140—93.4 **17 Claims**



1. A strapping tool of the type which crimps or notches a seal around overlapping strap ends extending in opposite directions in a tensioned strap loop around an article being tied, said tool comprising:

a main frame;

a sealer jaw assembly mounted for at least opening and closing movement about said seal relative to said frame;

a sealer jaw assembly actuator means for actuating the sealer jaw assembly; said sealer jaw assembly actuator means including

(1) a reciprocative drive member adapted to be moved

between a retracted position in which said jaw assembly is opened relative to said seal and an extended position in which said jaw assembly is engaged to crimp or notch said seal around the overlapping strap ends;

(2) a rack on said drive member;

(3) a pinion mounted for engaging said rack for at least a portion of its circumference and adapted to be rotated about its axis in a first direction to move said drive member to said extended position and adapted to be rotated about its axis in a second, opposite direction to move said drive member to said retracted position;

(4) a pawl mounted on said frame to pivot about an axis in said first and second directions and biased against rotation in both directions to an initial position; and

(5) means mounted on said pinion for rotating therewith to pivot said pawl about the axis in said second direction when said pinion is rotated in said first direction and for engaging said pawl to prevent rotation of said pinion in said second direction during engagement with said rack unless and until said pinion has been rotated through a predetermined angle.

4,289,175

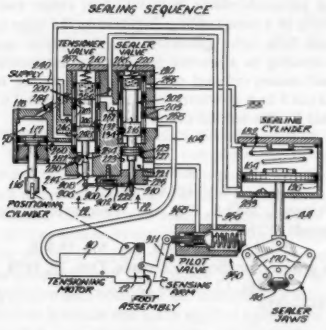
TENSION SENSING MECHANISM FOR POWER-OPERATED PUSH-TYPE STRAPPING AND SEALING TOOL

David E. Crittenden, Hoffman Estates; Barry R. Angarola, Schaumburg; Robert J. Nix, Park Ridge, and William A. Meier, Hoffman Estates, all of Ill., assignors to Signode Corporation, Glenview, Ill.

Filed Nov. 13, 1979, Ser. No. 93,386

Int. Cl.³ B65B *13/22, 13/34*

U.S. Cl. 140—93.4 **10 Claims**



1. A strapping tool for first tensioning a strap looped around an article with both overlapping strap portions threaded through a crimpable or notchable seal and with one strap free end doubled over and restrained between the seal and the article during tensioning and for then crimping or notching the seal around the tensioned overlapping strap portions, said tool comprising:

a. a frame adapted to rest upon said article;

b. an arm pivotally mounted on said frame for pivoting movement in a first direction and in a second, opposite direction;

c. an abutment means on said arm for engaging said seal during tensioning;

d. means for biasing said arm in said first direction during tensioning;

e. tensioning means mounted on said frame for engaging one of the overlapping portions of the strap and for pulling the same through the seal to tension the loop whereby the tension reaction urges said frame relative to the seal to force said arm abutment means against the seal and, at a predetermined tension level, causes said arm to overcome said biasing means and pivot relative to said frame in said second direction;

f. means for crimping or notching said seal around the overlapping portions of the strap; and

g. control means responsive to the pivoting movement of said arm in said second direction for operating said crimping or notching means.

4,289,176

BATTERY FILLER

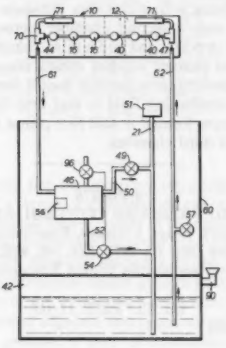
Christopher P. Evans, Bolton, England, assignor to Chloride Group Limited, London, England

Filed Oct. 4, 1979, Ser. No. 82,224

Claims priority, application United Kingdom, Oct. 9, 1978, 39775/78; May 29, 1979, 18584/79

Int. Cl.³ B65B *3/34*

U.S. Cl. 141—35 **14 Claims**



1. A battery filler comprising:

a reservoir,

conduit means for leading fluid from the reservoir to one or more cells of a battery,

a filling device for each of said cells which prevents further liquid entering each of said cells when a predetermined level has been reached,

a pump coupled to the conduit means downstream of said cells for drawing fluid by suction from the reservoir to said cells,

a sump in the conduit means between said cells and the pump,

a level-responsive switch in the sump arranged to initiate emptying of the conduit means by the pump when the liquid in the sump reaches a predetermined level,

a drain valve from the sump closed during filling and open after filling is completed in response to operation of said level-responsive switch,

a trolley upon which the conduit means, the pump, the sump, said level-responsive switch and said drain valve are mounted, and

means enabling the trolley to be moved from battery to battery.

4,289,177

TREE PROCESSING APPARATUS

Howard A. Hammond, Grayslake, Ill., and Paul H. Whitcomb, Woodstock, Canada, assignors to Eaton Corporation, Cleveland, Ohio

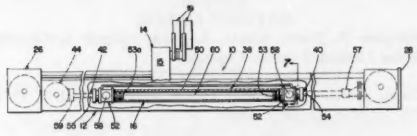
Filed Jan. 17, 1980, Ser. No. 112,770

Int. Cl.³ B27L *1/00*

U.S. Cl. 144—2 Z **9 Claims**

7. Apparatus for processing trees comprising an elongated boom, a processing head movable along said boom and operable to delimb a tree disposed adjacent said boom and parallel to

the longitudinal axis thereof, and drive means mounted on said boom including a hydraulic cylinder disposed along the horizontal axis of the boom for moving said processing head along the boom, said hydraulic cylinder comprising a body member; a first piston assembly having a first piston within said cylinder body and a first piston rod extending through a first end of said cylinder body; a second piston assembly having a second piston within said cylinder body and a second piston rod extending from the opposite end of said cylinder body, said piston assemblies defining a first chamber between said first piston and said first end, a second chamber between said second piston and said opposite end and a third chamber between said first and second pistons; conduit means connecting said first and second chambers; first passage means formed in said first piston rod for conducting fluid to said first chamber; and second passage means formed in said first piston rod for conducting fluid to said third chamber.



4,289,178

LIQUID PRESSURE CONTROL SYSTEM

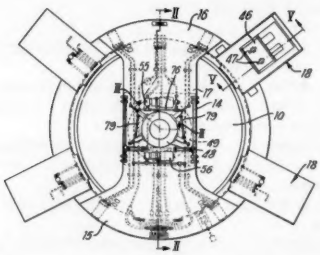
Bernard T. Rogers, Braes, Ullapool, Ross-shire, Scotland

Filed Dec. 18, 1978, Ser. No. 970,344

Claims priority, application United Kingdom, Dec. 19, 1977, 52799/77

Int. Cl.³ B27L *11/00*

U.S. Cl. 144—188 **15 Claims**



1. A liquid pressure control system for effecting advance of a slave member in steps along a path in a timed relationship with a succesion of discrete actions by a master device, comprising at least one pump and a liquid pressure operable slave actuator device which has a movable part by which the slave member is carried; said pump comprising a housing; a pump chamber formed in the housing, a liquid displacer housed movably within the pump chamber, a liquid pressure inlet connectable to a source of liquid pressure and which is arranged within the pump housing such that liquid pressure can be drawn into the pump chamber from said source by movement of the displacer, and a liquid pressure outlet which is in communication with a space of the slave actuator device and through which liquid is displaced under pressure from within the pump chamber to said space by movement of the displacer; and control means responsive to said succession to control the position of said displacer, said control means being adapted to move said displacer within the chamber in synchronism with said succession to displace from the pump chamber to the space of the slave actuator device a volume of liquid sufficient to effect a step of the slave member in a timed relationship with an action of said succession, whereby the slave member is positioned at a new location on said path for the next discrete action of said succession so that a predetermined spatial relationship between the master device and the slave member is established before each action of said succession and after the previous action of said succession, and to refill the pump chamber between each such displacement.

4,289,179

VENEER REINFORCING UNIT AND A VENEER REINFORCING DEVICE USING THE SAME

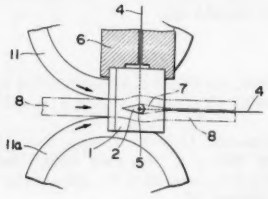
Yoshinori Koba, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Filed Oct. 26, 1979, Ser. No. 88,574

Claims priority, application Japan, Oct. 26, 1978, 53-132252; Nov. 6, 1978, 53-137098

Int. Cl.³ B27L *5/02*

U.S. Cl. 144—211 **31 Claims**



1. A veneer reinforcing unit comprising a first cutter having a cutting edge thereon; a second cutter provided on at least one side of said first cutter and having thereon a cutting edge extending perpendicularly from said first cutter and oriented substantially in a same cutting direction as the edge of the first cutter, said first cutter extending in a first plane, said second cutter extending in a second plane which intersects the first plane; and means on said second cutter defining means for guiding a cord to a downstream side of the second cutter into a cut made by the second cutter.

4,289,180

BANDSAW MILL

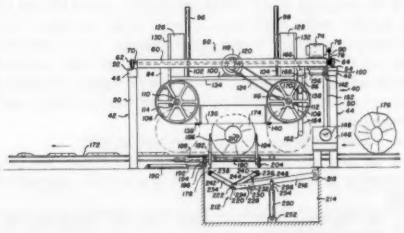
Frank Weinzierl, 2667 E. 57th Ave., Vancouver, British Columbia, Canada (V5S 2A9)

Filed Sep. 13, 1979, Ser. No. 75,348

Claims priority, application Canada, Oct. 27, 1979, 314525

Int. Cl.³ B27B *13/00, 29/00*

U.S. Cl. 144—312 **12 Claims**



1. A bandsaw mill comprising:

means for securing a log to be sawn in a generally horizontal position, said means for securing including a pair of spaced-apart clamp members extending from a clamp axis beneath the position of the log and perpendicular to the log axis, the clamp members being simultaneously rotatable about the clamp axis between a generally vertical position for securing the log and a lowered position for

moving the log to a position between the clamp members, the clamp members being movable towards each other along the clamp axis for securing the log between the clamp members;

a bandwheel mounting frame;

two vertical bandwheels for receiving and guiding a bandsaw, the bandwheels being mounted on the frame for rotation about horizontally spaced-apart axes;

a bridge for suspending the frame above the position of the log with the axes of the bandwheels being generally parallel to a longitudinal axis of the log, the position of the log being between the bandwheels;

a mechanism for raising and lowering the frame; and

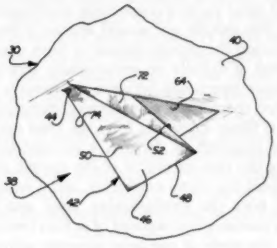
means for moving the bridge longitudinally along the position of the log.

4,289,181

FASTENER

Terry D. Capuano, Hinckley, Ohio, assignor to The Lamson & Sessions Co., Cleveland, Ohio

Filed Apr. 4, 1979, Ser. No. 26,889
Int. Cl.³ F16B *39/282*
U.S. Cl. 411—187 **2 Claims**



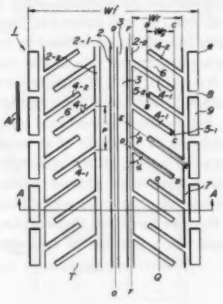
1. A fastener element for use in applying a force against a member, said fastener element comprising a body, thread means connected with said body for engaging a mating thread, said thread means cooperating with the mating thread during relative rotation between said body and the member in a first direction to urge said body toward the member to thereby tend to increase the force applied against the member, said thread means cooperating with the mating thread during relative rotation between said body and the member in a second direction to tend to decrease the force applied against the member, and retainer means connected with said body for retarding rotation between said body and the member in the second direction, said retainer means including a resiliently deflectable spring finger having a relatively narrow base portion which is integrally formed with said body and a relatively wide free end portion which penetrates the member under the influence of forces applied to said retainer means by said body upon initiation of rotation between said body and the member in the second direction, said spring finger including a first pair of side surfaces which extend transversely to each other and intersect at said free end portion of said spring finger, said first pair of side surfaces flaring outwardly from relatively narrow end portions at said base to relatively wide end portions which intersect at said free end portion of said spring finger, said spring finger further including a second pair of side surfaces which extend between said base and said free end portion of said spring finger and which intersect said first pair of side surfaces, said second pair of surfaces tapering outwardly from said base to sharp peaks at said free end portion of said spring finger.

4,289,182

PNEUMATIC TIRES FOR LARGE SIZE AND HIGH SPEED MOTORCYCLES

Takeshi Sato, Akigawa, and Hiroshi Kojima, Hino, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 17, 1979, Ser. No. 104,218
Claims priority, application Japan, Dec. 29, 1978, 53-162193
Int. Cl.³ B60C *11/04*
U.S. Cl. 152—209 R **8 Claims**



1. A pneumatic tire for motorcycles comprising, a tread extending about a crown of a toroidal carcass along a sectional profile of said carcass from a center of the crown to both sides thereof to such an extent that the tread has a width larger than a maximum width between sidewalls of the tire, said tread including a circumferential center groove located at the equatorial center line of the tread, a pair of circumferential central side grooves located adjacent and symmetrically on each side of said center groove, a pair of circumferential shoulder grooves located at shoulder portions adjacent to tread edges, circumferential ribs divided by said center groove and said central side grooves, and a pair of staggered ribs defined by said central side grooves, said staggered ribs having bending portions, said shoulder grooves and oblique grooves, said oblique grooves comprising first oblique grooves extending from said central side grooves toward the tread edges and terminating at top ends which do not reach the tread edges, and second oblique grooves which extend from shoulder grooves toward the central side grooves and terminate at top ends which do not reach the central side grooves and substantially parallel to the first grooves, each center line of said first and second oblique grooves inclined at an angle of 40° to 80° with respect to the center line of each central side grooves, bottoms of first oblique grooves at parts opening to each of the central side grooves and bottoms of the second oblique grooves at parts opening to each of the shoulder grooves are formed with projected platforms respectively, each bending portion of each staggered rib adjacent to the central side groove provided with a small groove aligned in parallel with the central side groove, and a pitch length defined by a circumferential interval between first oblique grooves is in the range of 1/40 to 1/60 of the total circumferential length of the tread.

4,289,183

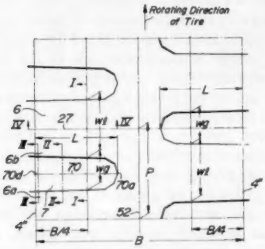
NOISELESS LUG TIRES

Masaru Abe, Sayama; Yoshihiro Sakai, Kawasaki; Yasutaka Enoki, Higashimurayama, and Noriyasu Sawada, Mitaka, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 107,740
Claims priority, application Japan, Jan. 13, 1979, 54/3190
Int. Cl.³ B60C *11/04*
U.S. Cl. 152—209 B **5 Claims**

1. In a lug tire comprising a number of lugs circumferentially

arranged along the periphery of a tread and spaced apart from each other and a number of transverse grooves which are the same in number as said lugs and delimiting said lugs, each of said transverse grooves being opened to only one of two shoulders of the tire and arranged at the left and right sides of the equatorial line of the tire and forming a pair of transverse grooves, each of said transverse grooves having a ratio Wg/Wl of equal to or smaller than 1.0 where Wg is a width of said transverse groove measured at a periphery passing a midpoint between the equatorial line of the tire and the shoulder of the tire and Wl is a width of said lug measured in the same manner as Wg, the improvement comprising; sides of left and right tread halves are divided by said equatorial line which is distant apart from a center line of a road defined by traffic regulations in order to reduce noise to the side of the road closest to the side of the road driven on, each of said transverse grooves as a whole is not inclined toward said opening thereof at a kickout side of each lug, but inclined toward said opening thereof at a stepin side of each lug at an angle of at most 22°, said angle being formed between a segment for connecting two ends of a center line of said transverse groove passing midpoints of widths of said transverse groove measured along the periphery of said tread on the one hand and the meridian line of the tire on the other hand, each portion of said center line of said



transverse groove in a substantially total region of a length L of said transverse groove extending along the meridian line of the tire inclined with respect to the meridian line of the tire at an angle within a range from at most 15° measured in a direction opposite to said inclined direction of said transverse groove as a whole to at most 60° measured in the same direction as said inclined direction and each portion of said center line of said transverse groove in a region extending at least 60% of said length L of said transverse groove is inclined with respect to the meridian line of the tire at an angle as defined above and within a range from at most 2° measured in a direction opposite to said inclined direction of said transverse groove as a whole to at most 30° measured in the same direction as said inclined direction, and in a region extending from the inner end of each of said transverse grooves to a position which is at least 75% of the length L of said transverse groove, said inclination of said transverse groove as a whole at the stepin side of each lug toward said opening of each of said transverse grooves is increased in response to the advance of tread wear, the groove center line is inclined away from the direction of advancement to facilitate the escape of air on the side of the vehicle closest to the curb or further from the center line of the road, and a slope is given to groove sidewalls to maintain the escape of air during wear life of the tire.

4,289,184

PNEUMATIC RADIAL TIRE FOR HEAVY LOAD VEHICLES INCLUDING IMPROVED BEAD PORTION REINFORCING CONSTRUCTION

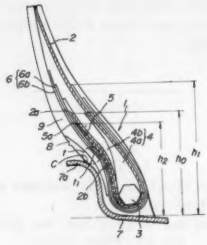
Kenichi Motomura, Kodaira; Hikaru Tansei, Higashimurayama, and Masaru Abe, Sayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jan. 15, 1980, Ser. No. 112,259

Claims priority, application Japan, Feb. 20, 1979, 54/20394[U]

Int. Cl.³ B60C *15/06*

U.S. Cl. 152—354 R **6 Claims**



1. A pneumatic radial tire for heavy load vehicles including an improved bead portion reinforcing construction, comprising; at least one carcass ply wound around a bead core from the inside toward the outside thereof to form a turn-up region and composed of radially or semi-radially arranged cords, a rubber stiffener interposed between the carcass ply and the turn-up region thereof and substantially triangular in section, said rubber stiffener extending from the bead core outwardly in the radial direction of the tire, a strengthening layer arranged along the turn-up region of the carcass ply and composed of at least one metal cord layer, and a reinforcing layer surrounding both the strengthening layer and the turn-up region of the carcass ply composed of at least two organic fiber cord layers, the cords of one layer crossing with the cords of the other layer, said reinforcing layer extending continuously from a height which is higher than both the outer upper end of the strengthening layer in the radial direction and the upper end of the turn-up region of the carcass ply to the inner surface of the carcass ply, said cords of the reinforcing layer extending along the outside of the carcass ply and are inclined on a circle formed by the upper end of the turn-up region of the carcass ply at an angle of 50° to 70° with respect to the radial plane of the tire, said cords of the reinforcing layer have an air gap ratio δ to 38% to 60% measured at a region where they cross with a line tangent to a curved surface of a rim flange and extending in parallel with the rotary axis of the tire and given by:

$$\delta = \frac{b - c}{b} \times 100\%$$

where, b is a distance between the two midlines of two adjacent cords, measured perpendicular to the cords, and c is a cord diameter.

4,289,185

VEHICLE TIRES HAVING A REMOVABLE TREAD

Carlo Franchini, and Luigi Maiocchi, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Nov. 21, 1978, Ser. No. 962,670

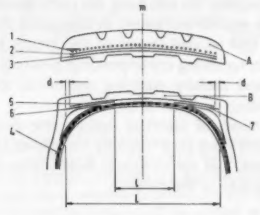
Claims priority, application Italy, Dec. 23, 1977, 31171 A/77

Int. Cl.³ B60C *9/00*

U.S. Cl. 152—361 DM **7 Claims**

1. A vehicle tire having a removable tread comprising a tread ring provided with a circumferentially inextensible annular reinforcing structure having substantially the same width as

said tread ring, and a casing with a radial metallic carcass, said casing supporting said tread ring in a radially outer position and maintaining the tread in its position centered with respect to the center plane of the carcass when the casing is under inflation pressure, said casing being provided with an annular breaker structure arranged in a radially outer position with respect to the carcass and being characterized in that said breaker structure comprises only one strip of metallic fabric arranged astride said center plane and substantially as wide as said annular reinforcing structure of the tread ring, the cords of said strip being all parallel to one another and inclined in a predetermined sense with respect to the circumferential direc-



tion of the tire at an angle ranging between 45° and 80°, and two tapes of metallic fabric, arranged with one at each lateral part of said strip, the axially outer edges of said tapes being substantially coincident with the axially outer edges of said strip to thereby leave free, between their axially inner edges, a central zone centered with respect to the center plane of the casing of a width between 8% and 69% of the maximum width of said breaker structure, the cords of said tapes being parallel to one another in each tape and being inclined at the same angle with respect to the circumferential direction of the tire, but in opposite senses with respect to the direction of the cords of said strip at an angle ranging between 45° and 80° with respect to the circumferential direction of the tire.

4,289,186

SEALING MEANS FOR PNEUMATIC TIRE AND WHEEL RIM ASSEMBLIES

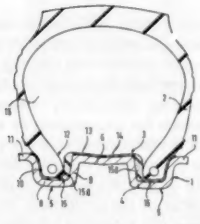
Ralph Wilde, Near Leamington Spa, England, assignor to Dunlop Limited, West Midlands, England

Filed Feb. 28, 1980, Ser. No. 125,631

Claims priority, application United Kingdom, Mar. 7, 1979, 08018/79

Int. Cl.³ B60C *5/16, 19/04*

U.S. Cl. 152—379.3 **8 Claims**



1. A pneumatic tire and wheel rim assembly in which said rim has a pair of axially spaced bead seats defined by grooves in each of which a respective one of a pair of substantially inextensible axially spaced tire beads is located and retained and sealing means comprising a pair of elastomeric seal elements each of which acts between a respective one of said tire beads and the associated groove whereby each tire bead is held under compression in an axial direction in the associated groove so that the seal elements seal the beads to the rim by axial compression.

4,289,187

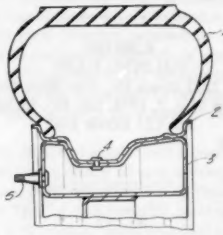
PNEUMATIC WHEELS FOR VEHICLES

Evgeny I. Rivin, 1114 Pierre Ave., Windsor, Ontario, Canada (N9A 2L4)

Continuation-in-part of Ser. No. 830,073, Sep. 2, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 946,497

Int. Cl.³ B60C *23/10, 29/00*

U.S. Cl. 152—418 **3 Claims**



1. In a vehicle having a body, wheels rotatably supported on the body, and inflated fluid tires on the wheel, the improvement comprising: a fluid chamber supported on the wheel; and a structure defining a bi-directional energy dissipating orifice connecting the interior of the chamber with the pressurized volume within the tire, the structure defining the orifice having a viscous permeability

$$\phi = B\frac{v_r\mu l}{n p_o A}\cdot\frac{w_o}{\sqrt{\left(\frac{v_r}{v_t}+1\right)\left(\frac{v_r}{v_t}+2\right)}}$$

where $1.4 \leqq B \leqq 7$ depending on typical excitation from the road surface, where ϕ = viscous permeability of the connective canal, v_r = the volume of the chamber; μ = the dynamic viscosity of media inside the cavity, l = the length of the connective canal, n = the polytropic exponent of the fluid, ρ_o = the initial pressure in the tire cavity, A = the cross sectional area of the orifice, w_o = the angular natural frequency of the tire, v_t = the volume of the tire, whereby rapid increases in the pressure within the tire as a result of the impact of the tire with obstacles causes fluid flow through the orifice, into the chamber, dissipating a substantial portion of the fluid energy in thermal form and thereby reducing the shock transmitted to the vehicle.

4,289,188

METHOD AND APPARATUS FOR MONITORING ETCHING

Tatsumi Mizutani, Kokubunji; Kazuyoshi Ueki, Ohme; Shinya Iida, Tama, and Hideo Komatsu, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 19, 1980, Ser. No. 150,939

Claims priority, application Japan, May 28, 1979, 54/65031

Int. Cl.³ H01L *21/306;* **C23F** *1/00*

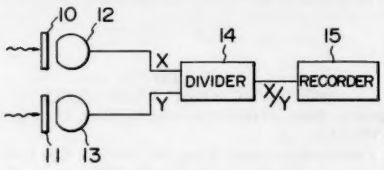
U.S. Cl. 156—626 **12 Claims**

1. A method for monitoring etching process for etching a workpiece by ions or radical sproduced by glow display plasma, comprising the steps of:

correcting a specific spectrum intensity, which is dependent

on the process of said etching process, of atoms or molecules produced in said plasma by another spectrum intensity which is independent of the process of said etching process; and

monitoring a resulting signal intensity.



4,289,189

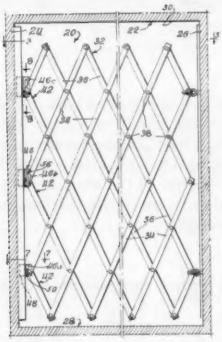
FOLDING GATE

Joseph Catalano, 2212 Beach Dr., Fox River Grove, Ill. 60021

Filed Mar. 7, 1979, Ser. No. 18,316

Int. Cl.³ EO6B *3/92*

U.S. Cl. 160—160 **1 Claim**



1. In a folding gate which includes a web including a pair of sets of strips, the strips of each set lying essentially in a plane and being parallel and the sets being fitted together with the planes fitted flat together and the strips in the respective sets in mutually angular relation, the strips of the two sets being pivotally secured together at points of their intersection, the joined ends of the strips forming scallops at the ends of the web, and there being a plurality of such scallops at each end, the web being extensible and contractible longitudinally and the web decreasing and increasing in transverse direction respectively in response to its being extended and contracted,

the construction comprising, means for mounting the web on a jamb of a doorway including

(a) a single rail in the form of an angle iron uniform in shape throughout its length having a pair of legs thereby also extending throughout its length, the legs being at an angle to each other, one of the legs being adapted for fitting flat to and securement to an element of the jamb extending transverse to the doorway and itself thereby extending transverse to the doorway, the other leg constituting a supporting element directed in the longitudinal direction of the doorway when the rail is mounted on the jamb, and having a flat surface extending throughout the full length of the rail and also its own full extent in said longitudinal direction, that is clear and unencumbered,

(b) a plurality of hinges separate from each other and each having a pair of leaves connected together by a pintle, the leaves being flat pieces, a first leaf of each pair being fitted in flat face-to-face engagement, throughout substantial area, with the flat surface of said supporting element of the rail and secured thereon by weld, the hinges being spaced apart along the length of the rail according to their points of connection with the web which are pre-determined according to the construction of the web, as stated below, the supporting element being unobstructed and uniform throughout its height except for the application of the hinges thereto,

a second leaf of each pair of leaves of the hinges being pivotally connected with the web at said scallops at the end of the web,

one of said second leaves of the hinges having a hole without material elongation in any direction receiving a corresponding pivoting element in the web and that hinge being thereby operable for retaining the corresponding portion of the web against movement in transverse direction, and the other said second leaves of the hinges having elongated holes receiving corresponding pivoting elements in the web and thereby enabling transverse movement of corresponding portions of the web,

said hinges being of identical outline size and shape and distinguished from each other by the size and shape of the holes therein, and the elongated holes being so elongated in the direction of the pintles.

4,289,190

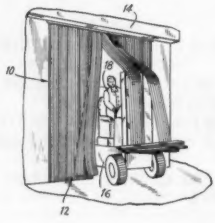
PLASTIC STRIP CLOSURES AND METHODS OF PROTECTING THE SAME

Robert Catan, Smithtown, N.Y., assignor to Dynaforce Corporation, Old Bethpage, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,851

Int. Cl.³ A47H *1/00, 23/00*

U.S. Cl. 160—332 **10 Claims**

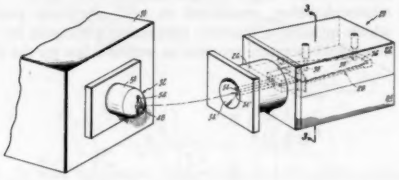


1. A closure for an opening, said closure comprising a plurality of strips, and means to suspend said strips in depending and overlapping relation to obturate said opening, said strips being of flexible material to permit the passage of objects through the opening, said strips being substantially transparent and including projections thereon for engagement by said objects, said strips having opposite planar faces with the projections being located on only one of said faces, the strips having lateral edges and having selected of said projections closely adjacent said lateral edges and other of the projections betwen said edges, said projections being ribs extending longitudinally along said strips, said ribs being spaced at an order of magnitude of about two inches whereby to maximize clarity of said closure and minimize scratching thereof, said strips being arranged in generally two planes, the strips in each plane substantially covering the strips in the other plane but being staggered relative thereto, the ribs on the strips in each plane protruding away from the strips in the other plane whereby the faces of the strips facing one another are planar.

4,289,191
INJECTION MOLDING THERMOPLASTIC PATTERNS HAVING CERAMIC CORES

Richard A. Myllymaki, Quaker Hill, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 2, 1980, Ser. No. 136,599
Int. Cl.³ B22C 7/02, 7/06
U.S. Cl. 164—45 9 Claims



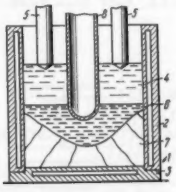
1. In the process of fabrication of a ceramic investment casting mold containing a thin and brittle ceramic core, wherein a thermoplastic polymer is injection molded into a die to form an expendable pattern in a die cavity, wherein a portion of the mold defines a shape of the airfoil of a gas turbine, the improvement which comprises simultaneously injecting the polymer on either side of the core from an end of the die through at least two sprues with balanced flow that minimizes hydrostatic force on the core.

5. In apparatus for injection molding the combination comprising a single port nozzle having a surface relief channel intersecting the port and a multiple ports die, the nozzle and die defining a liquid carrying cavity when mated, the portion of the nozzle which defines the cavity having a higher surface area than the portion of the die which defines the cavity.

4,289,192
METHOD AND APPARATUS FOR PRODUCING A SOLID-SECTION INGOT BY ELECTROSLAG REMELTING

Rudolf S. Dubinsky, ulitsa Politekhnicheskaya, 5, kv. 209; Boris I. Medovar, ulitsa Anri Barbjusa, 22/26, kv. 109, and Georgy A. Boiko, ulitsa Vladimiro-Lybedskaya, 16, kv. 106, all of Kiev, U.S.S.R.

Filed Apr. 19, 1979, Ser. No. 31,485
Int. Cl.³ B22D 27/02
U.S. Cl. 164—470 14 Claims



1. A method for producing a solid-section ingot by electroslag remelting, including:

remelting at least one consumable metal electrode in a slag bath in a melting container to form in said container a molten metal bath progressively crystallizing into an ingot so that the interface between the crystallized metal and the molten metal constituting the metal bath forms the bottom of the bath, the slag-metal bath interface moving upwardly as the molten metal is fed into the melting container;

bringing a cooled body into contact with the molten metal constituting the metal bath so that said cooled body is disposed on the vertical axis of symmetry of said melting container;

maintaining said cooled body in contact with the molten metal till the melting operation is complete by moving said cooled body upwardly at a speed close to a predetermined solidifying rate to avoid contact with the crystallized metal; and

removing said cooled body from the metal bath after the melting operation is complete.

6. An electroslag remelting apparatus for producing a solid-section ingot by remelting at least one consumable metal electrode in a slag bath, comprising:

a bottom plate;

a movable open-ended mold defining an inner space therein and disposed over said bottom plate for vertical movement and supported in its lowermost position on said bottom plate and forming therewith a melting container;

a lifting device installed adjacent said melting container and operatively connected with said movable mold;

a liquid metal level detector installed in the wall of said movable mold commands wherefrom ensure the controlling of the vertical movement of said movable mold in accordance with the movement of the slag-metal interface relative to the detector in the course of the melting operation; and

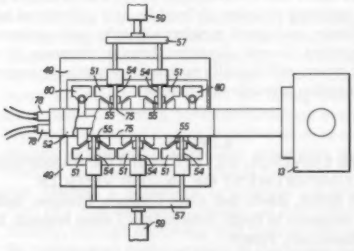
a cooled body disposed inside said movable mold on the vertical axis of symmetry of said melting container, said cooled body comprising supporting members secured to the top end face of said movable mold and an extension projecting downwardly from said end face for a length less than the height of said movable mold, the extension of said cooled body including a wide portion disposed below the level of said liquid metal level detector, a narrow portion disposed above said wide portion, and an intermediate portion whose surface is shaped similar to a cone and connects said narrow and wide portions, thereby providing for flow of molten metal drops down from the surface of said cooled body.

7. An apparatus according to claim 6, wherein said extension of said cooled body is made in the form of a grating composed of pipes.

4,289,193
ACCUMULATOR PLATE ASSEMBLY METHODS

Thomas B. Stamp, "Laurentides", Haymes Rd., Cleeve Hill, Cheltenham, Gloucestershire, England

Filed Jun. 25, 1979, Ser. No. 52,011
Claims priority, application United Kingdom, Jun. 23, 1978, 27779/78
Int. Cl.³ B22D 19/04, 23/04, 25/04
U.S. Cl. 164—109 1 Claim



1. A method of casting a metal component and simultaneously attaching said component to a battery plate, comprising locating a portion of the plate in a mold cavity, supplying molten metal from one end into an elongated supply duct by means of a positive displacement pump to cause the level of metal in said duct to rise and the metal to spill over a weir into said cavity, continuously cooling the cavity and continuously heating the duct, and after filling the cavity removing molten metal from the same supply end of the duct by means of said

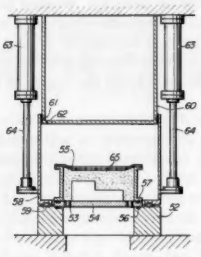
positive displacement pump thereby to reduce the level of metal in the duct and to reduce the level of metal in the mold cavity back to the level of the weir, and after the metal in the cavity has solidified, removing the battery plate from the mold cavity with the cast metal component attached.

4,289,194

MOLDING MACHINE

Nagato Uzaki, Toyokawa; Yasutaro Kawamura, Okazaki; Kimikazu Kaneto, Toyokawa, and Masaharu Hasizume, Chiryu, all of Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed Sep. 19, 1979, Ser. No. 77,124
Claims priority, application Japan, Apr. 11, 1979, 54/44609
Int. Cl.³ B22C *15/06, 15/08*
U.S. Cl. 164—170 **16 Claims**



1. A molding machine comprising:
a pattern provided with a plurality of vent bores formed at desired portions thereof;
a molding flask arranged to be combined with said pattern;
means for sealingly covering said molding flask and said pattern combined with said molding flask so as to form a closed space above said pattern; and
means, mounted in said covering means, for supplying compressed air into said closed space, said compressed air being discharged from said closed space to the outside through said vent bores, wherein said covering means comprises a cover member, and a hollow cylindrical member defining an upper end opening and a lower end opening, said cover member being air-tightly, slidably engaged in said cylinder member through said upper end opening, said lower end opening being defined by a flange extending radially inwardly of said cylindrical member such that said lower end opening has an opening area less than that of said upper end opening so as to form an effective pressure receiving chamber defined by said cylindrical member, flange, and cover member whereby said compressed air supplied to said chamber through openings in said cover means will forcedly push said cylindrical member in the direction towards said pattern.

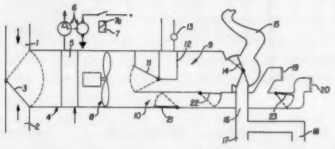
4,289,195

CLIMATE CONTROL DEVICE FOR THE PASSENGER COMPARTMENT OF MOTOR VEHICLE

Dominique Bellot, Rueil, and Alain Cohenca, Meudon, both of France, assignors to Regie National des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 7, 1979, Ser. No. 73,293
Claims priority, application France, Sep. 29, 1978, 78 27998
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—12 **12 Claims**

1. A climate control device for the passenger compartment of a motor vehicle including a heating radiator, comprising:
fan means,
an air distribution conduit disposed in the passenger compartment, an air mixing shutter positioned at an opening of the air distribution conduit which diverts a variable amount of the air flow from the fan means to the heating radiator,
a defrosting conduit and a conduit with outlets at a floor portion of the passenger compartment,
a distribution shutter placed between said defrosting conduit and said conduit with outlets at the floor portion of the passenger compartment,
electronic probes for measuring the temperature inside and outside the passenger compartment,
a microcalculator, connected to said electronic probes, which includes a memory containing a formula for the interior temperature required as well as a law for the flow



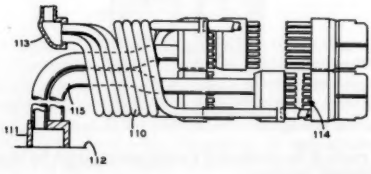
from the fan means, both as a function of the outside temperature, the calculator being programmed for receiving temperature measurement data and processing such data so as to generate signals which depend upon the comparison between the required temperature law and the measured inside temperature and means for generating signals therefrom,
a plurality of micromotors controlling the mixing and distribution shutters in response to signals generated from said means for generating signals, and
means for controlling feed of the heating radiator and signals commanding the supply of electricity to the fan means in accordance with said flow law.

4,289,196

MODULAR HEAT EXCHANGERS FOR CONSOLIDATED NUCLEAR STEAM GENERATOR

Felix S. Jabsen; Donald C. Schluderberg, and Arnold E. Paulson, all of Lynchburg, Va., assignors to The Babock & Wilcox Company, New Orleans, La.

Division of Ser. No. 626,820, Oct. 29, 1975, Pat. No. 4,124,064, which is a division of Ser. No. 327,349, Jan. 29, 1973, Pat. No. 3,941,187, which is a continuation-in-part of Ser. No. 162,359, Jul. 14, 1971, abandoned. This application Aug. 24, 1978, Ser. No. 936,426
Int. Cl.³ F28F *9/22;* **F22B** *37/22*
U.S. Cl. 165—83 **2 Claims**



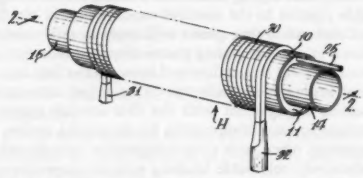
1. A group of modular heat exchangers each of the heat exchangers comprising a steam header, a feedwater header spaced from the steam header, said headers each forming respectively a steam chamber and a feedwater chamber, a feedwater tube that passes through the steam chamber to establish fluid communication with the feedwater chamber, a shroud positioned around the feedwater tube, said steam header and feedwater header having surface recesses for confining the shroud, a feedwater manifold and coiled feedwater manifold tubing in fluid communication with the feedwater manifold and the shrouded feedwater tube in at least some of the modular heat exchangers.

4,289,197

HEAT EXCHANGER

Thomas J. McNamara, 1384 Brown St., Des Plaines, Ill. 60016

Filed Mar. 12, 1979, Ser. No. 19,758
Int. Cl.[3] F28D *3/04*
U.S. Cl. 165—115 14 Claims



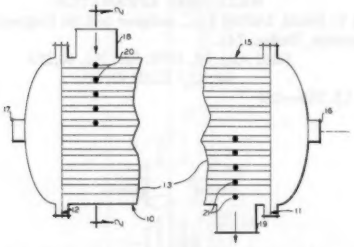
1. A heat exchanger comprising, a horizontally-disposed elongate shell, a partition within and extending lengthwise of said shell to form upper and lower compartments within the shell, end closures for said shell with at least one end closure having a flow passage communicating with one of the compartments of said shell, a fluid port communicating with the other of said compartments, means providing for gravity fluid flow from the upper compartment into said lower compartment by flow onto the interior surface of the shell along the length thereof, and fluid containment means substantially enclosing the exterior of the shell for substantially the entire length of the shell to place fluid in the fluid containment means in heat exchange relation with said shell wall.

4,289,198

HEAT EXCHANGER

Richard K. Young, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 9, 1978, Ser. No. 959,283
Int. Cl.[3] F28D *7/00*
U.S. Cl. 165—159 7 Claims



1. A shell and tube heat exchanger comprising in combination:

a longitudinal shell,

tube sheets at opposite ends of said shell,

a plurality of tubes in a bundle of generally cylindrical form extending between said tube sheets,

means to introduce fluid to said tubes and withdraw fluid from said tubes at the faces of said tube sheets,

shell inlet means to introduce fluid to the interior of said shell external of said tubes, and shell outlet means to withdraw fluid therefrom, and

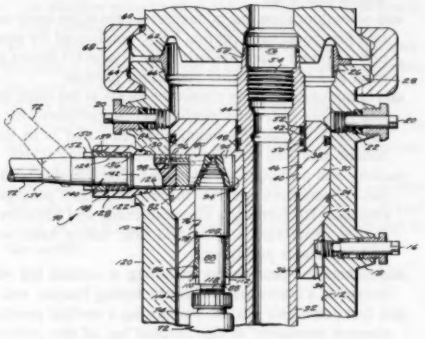
a stream distributing means or baffle comprising a flow deflecting means positioned transverse of the tubes and filling substantially all of the space between adjacent rows of tubes in a direction perpendicular to the axis of the shell inlet and/or shell outlet which means are located between the centerline of a pass of the exchanger and the shell inlet and/or shell outlet and in substantial alignment with the longitudinal axis of the shell inlet and/or shell outlet and the space between rows of tubes beyond said centerline of said pass of the exchanger, and in substantial alignment with said flow deflecting means, being substantially devoid of flow directing means to provide improved shell side fluid distribution of the inlet and/or outlet by distributing a fluid entering and/or exiting the shell side of the exchanger so that at least a portion of the entering or exiting fluid is directed toward the adjacent tube sheet.

4,289,199

WELLHEAD SIDEWALL ELECTRICAL PENETRATOR

John K. McGee, Houston, Tex., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 28, 1979, Ser. No. 79,954
Int. Cl.[3] E21B *33/03*
U.S. Cl. 166—65 R 4 Claims



1. A wellhead sidewall communications line penetrator arrangement for linking a communication line that is to extend within a well to a down hole device with a communication line which is to extend outside the well to a remotely located control site,

said penetrator arrangement comprising:

a tubing head having a throughbore with a tubing hanger seat therein:

a tubing hanger having a throughbore means for hangingly supporting a tubing string;

said tubing hanger further having a shoulder for seating the tubing hanger on said tubing hanger seat, and means cooperable with the tubing head for providing and fixing a predetermined angular orientation of the tubing hanger relative to the tubing head;

means defining a penetrator passageway extending into the tubing hanger from the axially lower end of the tubing hanger and laterally, at least generally horizontally, out of the tubing hanger through the side of the tubing hanger below the axially upper end of the tubing hanger;

sealing means for sealing between the tubing head throughbore and the tubing hanger in such a sense as to seal off a vicinity surrounding where the penetrator passageway emerges out the side of the tubing hanger;

means defining a penetrator passageway extension in the form of a bore extending laterally, at least generally horizontally, through the tubing head from the throughbore of the tubing head to the exterior of the tubing head;

a first penetrator portion comprising a body means having a lower end and an outer end and with at least one communication line communicating member extending from said lower end to said outer end, said at least one communication line member being provided with a communication line connector means at each end thereof;

said first penetrator portion being configured for installation in said penetrator passageway so that its lower end is accessable from the axially lower end of tubing hanger and so that its outer end lies within said penetrator pas-

sageway near the outer end of said penetrator passageway;

packing and packing activation means installable about said first penetrator portion in said penetrator passageway for forming a circumferential seal between said first penetrator portion and said tubing hanger within said penetrator passageway;

a further penetrator portion comprising a body having an inner end and an outer end with at least one communication line communicating member extending from said inner end to said outer end, said at least one communication line member being provided with a communication line connector means at each end thereof;

said communication line connector means at the lower end of said first penetrator portion being configured for connection with said communication line that is to extend within said well;

said communication line connector means at the outer end of said first penetrator portion being configured for connection with said communication line connector means at the inner end of said further penetrator portion;

said communication line connector means at the outer end of said further penetrator portion being configured for connection with said communication line that is to extend outside said well to a remotely located control site;

packing and packing activation means installable about said further penetrator portion in said penetrator passageway extension for forming a circumferential seal between said further penetrator portion and said tubing head within said penetrator passageway;

said penetrator passageway including a vertical leg which intersects a lateral leg within the tubing hanger; and

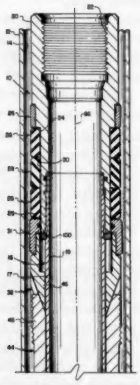
said first penetrator portion comprising a vertical penetrator element extending in the vertical leg of the penetrator passageway, and a lateral penetrator element extending only in the lateral leg of the penetrator passageway, the vertical and lateral penetrator elements being operatively plugged together within the penetrator passageway via connector means provided on each of said vertical and lateral penetrator elements.

4,289,200

RETRIEVABLE WELL APPARATUS

Hiram H. Fisher, Jr., Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Sep. 24, 1980, Ser. No. 190,308
Int. Cl.[3] E21B *33/124, 23/06, 33/129*
U.S. Cl. 166—120 **8 Claims**



1. A retrievable apparatus adapted to be inserted in a first subterranean conduit means such as a well to provide a seal in the annulus formed between the first conduit means and a second conduit means disposed therein comprising:

tubular mandrel means adaptable to be sealingly associated with the second conduit means having first seal urging means at one end of the mandrel means;

housing means disposed around the end of the mandrel means opposite the first seal urging means and including second seal urging means, the housing means being moveable relative to the mandrel means whereby the first and second seal urging means will apply in axial compression force to annular sealing means disposed therebetween;

annular sealing means disposed between the first and second seal urging means adapted to be urged outwardly into sealing engagement with the first conduit means in response to axial compression by the urging means, and to contract when such axial compression is removed;

a selectively releasable latching system cooperatively coupled between the housing and the end of the mandrel means opposite the first urging means for permitting movement of the housing relative to the mandrel means to move the first seal urging means toward the second seal urging means and thereby apply a compressive force to the sealing means therebetween and then holding the relative positions of the mandrel means and housing means until selectively released to remove the compressive force on the sealing means and permit retrieval of the apparatus, the latching system including:

ratchet means for permitting relative movement between the housing and the ratchet means in a direction to apply a compressive force to the sealing means and hold the compressive force on the sealing means, and

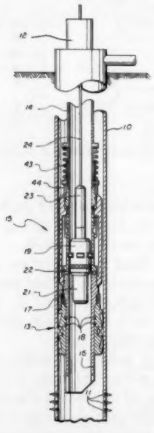
selectively releasable coupling means coupling the ratchet means to the mandrel means, the coupling means including sleeve means disposed within the mandrel means and axially shiftable from a first position to a second position to decouple the ratchet means from the mandrel means and thereby release the compressive force held on the sealing means.

4,289,201

WELL TEST APPARATUS

John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 20, 1979, Ser. No. 68,213
Int. Cl.[3] E21B *43/00*
U.S. Cl. 166—183 **7 Claims**



1. A well test apparatus comprising,

a by-pass valve having a tubular body with a tailpipe adapted to sealingly engage a well packer,

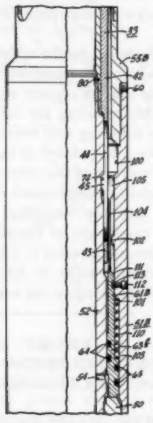
said valve having a bore extending therethrough and a landing nipple configuration in said bore,
a locking mandrel in said nipple configuration,
said mandrel having seal means sealing with the bore through said body,
said body having ports therein on opposite sides of said seal means,
a sleeve valve member reciprocal with and seatingly engaging said body,
said sleeve valve member providing with said body a by-pass passageway interconnecting said ports to by-pass fluid about said locking mandrel,
said sleeve valve member controlling flow through said passageway,
said sleeve valve member having pressure responsive areas responsive to the differential in pressure in said bore and exterior of said valve,
resilient means urging said valve member against the force exerted by exterior pressure, and
a transducer fitting in said locking mandrel.

4,289,202

WELL TUBING COUPLING APPARATUS

William D. Henderson, Frisco, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 20, 1979, Ser. No. 67,746
Int. Cl.³ E21B *43/00*; F16L *35/00*
U.S. Cl. 166—212 **22 Claims**



1. Apparatus for releasably coupling an upper tubing string with a lower tubing string in a well bore comprising; a lower tubular body section connectible on the upper end of a lower tubing string; an upper tubular body section connectible on the lower end of an upper tubing string; said lower and upper body sections being disconnectible and connectible together by longitudinal movement only of one of said sections relative to the other of said sections; and locking means on said upper and on said lower body sections each operable by hydraulic pressure for disconnecting said upper section from said lower section and for reconnecting said upper section with said lower section.

4,289,203

OIL DISPLACEMENT METHOD USING SHEAR-THICKENING COMPOSITIONS

Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 868,965, Jan. 12, 1978, Pat. No. 4,212,747.
This application Jan. 8, 1980, Ser. No. 110,438
Int. Cl.³ E21B *33/138, 43/22, 43/267*
U.S. Cl. 166—274 **10 Claims**

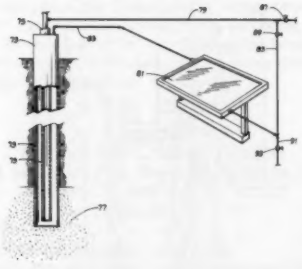
1. A process for displacing oil within a subterranean formation which comprises
injecting into the formation through an injection well an aqueous shear-thickening composition comprising
(a) a small but effective amount of a high molecular weight polyalkylene oxide and
(b) a small but effective amount of a synthetic resin comprising the reaction product formed by heating an aqueous alkaline mixture of an aldehyde having from one to four carbon atoms and a phenol compound,
the amounts of (a) and (b) being sufficient to form a sher-thickening composition that is fluid in a quiescent state but becomes gel-like in character on agitation, and
(c) the balance of the composition being water
at a pressure sufficient to force said composition into the more permeable portions of said formation and temporarily plug same and
introducing into the formation a drive fluid at a pressure sufficient to force oil from the less permeable oil-rich zones of the formation toward a production well and to the surface.

4,289,204

SOLAR HEAT TREATING OF WELL FLUIDS

Orvel L. Stewart, Ardmore, Okla., assignor to Sun Tech Energy Corporation, Oklahoma City, Okla.

Filed May 3, 1979, Ser. No. 35,494
Int. Cl.³ E21B *37/00, 43/24*
U.S. Cl. 166—303 **3 Claims**



1. A method of treating an oil well flow line that conducts well fluids for removing paraffin from the flow line, comprising the steps of:
a. diverting the well fluids from the flow line at a location upstream of the portion of the flow line to be treated;
b. heating the diverted well fluids by solar heating means; and
c. returning the heated well fluids to the flow line upstream of the portion of the flow line to be treated and downstream of the point of diverting.

4,289,205

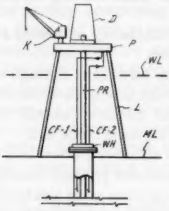
WELL SAFETY SYSTEM METHOD AND APPARATUS

James D. Mott, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Division of Ser. No. 2,197, Jan. 9, 1979. This application Dec. 12, 1979, Ser. No. 102,650

Int. Cl.³ E21B *31/00*

U.S. Cl. 166—315 **4 Claims**



1. A method of retrieving a full opening subsurface safety valve from a subsurface tubing hanger in a well, including the steps of:

elevating the well tubing at the wellhead for separating a safety joint connected with the well tubing above the safety valve to release the upper well tubing;

elevating the upper well tubing a sufficient distance to realign a connector;

manipulating the upper well tubing to reconnect with the portion of the well tubing below the safety joint;

releasing a tubing holddown below the safety joint to enable retrieval of the subsurface safety valve; and

retrieving the safety joint, holddown and subsurface safety valve with the well tubing from the subsurface tubing hanger.

4,289,206

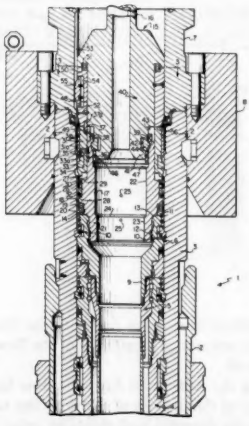
REMOTE MULTIPLE STRING WELL COMPLETION

Kerry G. Kirkland, Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Aug. 20, 1979, Ser. No. 67,745

Int. Cl.³ E21B *23/00, 33/076*

U.S. Cl. 166—348 **6 Claims**



1. For use in installing multiple string underwater well apparatus of the type comprising a tubular support structure located under water above the well bore and having an internal support surface and rotational orientation reference means located above the support surface, the combination of

a tubular hanger body adapted to be landed on the support surface and having

stop surface means comprising an annular series of circularly spaced upwardly directed stop surfaces lying in a common place at right angles to the longitudinal axis of the hanger body;

seal means carried by the hanger body for sealing between the hanger body and a surrounding portion of the tubular support structure after the hanger body has been landed, the seal means comprising

an energizable seal ring surrounding the hanger body,

an actuating sleeve slidably embracing the hanger body above the seal ring, and

means restraining the actuating ring from rotational movement relative to the hanger body, and

a handling tool comprising

a main body connectable to a handling string and provided with an annular series of circularly spaced downwardly projecting lugs dimensioned and disposed to engage the respective stop surfaces of said stop surface means when the handling tool is in a first rotational position relative to the hanger body and to extend between adjaent respective pairs of the stop surfaces when the handling tool is in a second rotational position relative to the hanger body,

means releasably securing the main body of the handling tool to the hanger body with the main body occupying said first position and with the main body being capable of rotation about its longitudinal axis relative to the hanger body,

a tubular body slidably embracing the main body of the handling tool and having a lower end dimensioned to engage the upper end of the actuating sleeve of the seal means,

means interconnecting the tubular body and the actuator sleeve and operative to prevent relative rotation therebetween,

locator means carried by the tubular body and capable of coacting with the rotational orientation reference means of the tubular support structure, and

means releasably securing the tubular body to the main body of the handling tool whereby, after the handling tool has been manipulated to land the hanger body on the internal surface of the tubular support structure in a rotational position determined by coaction of the locator means and the rotational orientation reference means, the main body of the handling tool can be rotated to its second position to allow the handling tool to be moved downwardly to force the actuating sleeve downwardly to energize the seal ring.

4,289,207

FIRE EXTINGUISHING SYSTEM

Gregory M. Wernert, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

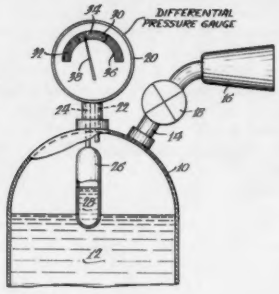
Filed Feb. 5, 1979, Ser. No. 8,981

Int. Cl.³ A62C *11/00*

U.S. Cl. 169—30 **3 Claims**

1. In a fire extinguishing system including a pressure vessel (**10**) filled to a desired fill density with a non-solid fire extinguishing material (**12**) having a vapor pressure that fluctuates with temperature, a controllable outlet (**14,16,18**) from said vessel, and a pressure sensing device (**20**) for monitoring the pressure in said vessel, the improvement wherein said pressure sensing device includes a differential pressure sensing device (**20**) having two input ports (**22,24**), one (**22**) of said ports being in fluid communication with the interior of said pressure vessel, and a sealed second vessel (**26**) in sufficiently close proximity to said pressure vessel so as to be exposed to the same

ambient temperatures as the pressure vessel and filled with said fire extinguishing material (**28**) substantially to said desired fill



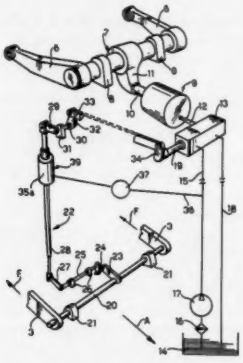
density, the other (**24**) of said ports being in fluid communication with the interior of said second vessel.

4,289,208

DEVICE FOR CONTROLLING AGRICULTURAL IMPLEMENTS MOUNTED ON AN AGRICULTURAL VEHICLE

Giuseppe Roncarolo, Modena, Italy, assignor to Fiat Trattori S.p.A., Modena, Italy

Filed May 8, 1979, Ser. No. 37,084
Claims priority, application Italy, Jul. 12, 1978, 68648 A/78
Int. Cl.³ A01B *63/111*
U.S. Cl. 172—7 **4 Claims**



1. Device for controlling agricultural implements mounted on agricultural vehicles, comprising, in combination:

linkage means for articulation of said implement to said vehicle, adapted to permit vertical movement of said implement in a longitudinal plane relative to said vehicle;

a hydraulic single-acting actuator having a rod connected to said linkage means for controlling said vertical movement;

hydraulic supply means for said actuator;

a hydraulic distributor, interposed between said supply means and said actuator, for controlling the operation of said actuator, said distributor having a control member movable between a rest position, in which said actuator is not supplied with hydraulic fluid and said implement is lowered, and a working position, in which said actuator is supplied with hydraulic fluid to effect lifting of said implement;

a resiliently deformable element connected to said linkage means, and supported by a fixed structure of said vehicle, such that the deformation of said deformable element results from reaction forces transmitted from the ground to said implement, and

mechanical transmission means interposed between said deformable element and said distributor control member, to urge said control member into its working position, so as to effect lifting of said implement when said reaction force exceeds a predetermined value,

wherein the improvement consists in said device further comprising:

an auxiliary hydraulic actuator, means connecting said actuator to said supply means and to said distributor whereby the said auxiliary actuator will be operated when said distributor control member is moved into its said working position,

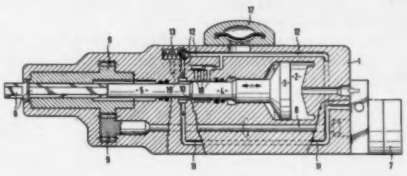
said auxiliary actuator being included in said mechanical transmission means which connects said resilient bar to said distributor control member so as to urge said distributor control member into its said rest position.

4,289,209

IMPACT DEVICE WITH FLUID TOOL ROTATION MOTOR

Pekka Salmi, Tampere, Finland, assignor to Oy Tampella AB, Finland

Filed Aug. 7, 1979, Ser. No. 64,649
Claims priority, application Finland, Aug. 8, 1978, 782422
Int. Cl.³ B25D *16/00, 9/12*
U.S. Cl. 173—107 **8 Claims**



1. A rock drilling machine including a cylinder and a striking piston fitted to reciprocate therein in response to a pressure medium travelling through a first duct, a rotation motor drivable by a pressure medium travelling through a second duct, wherein said first and second ducts are not connected, a pump piston and a pump cylinder with the pump piston arranged to travel in the pump cylinder and being permanently connected to the striking piston, the pump cylinder being concentric with the cylinder carrying said striking piston and being positioned at an axial distance therefrom, said pump piston being arranged to pump pressure medium to said rotation motor during a work stroke of the striking piston.

4,289,210

IMPACT DRILL BIT ACTUATOR

William H. Schoeffler, P.O. Box 91105, Lafayette, La. 70509

Filed Feb. 27, 1980, Ser. No. 125,125
Int. Cl.³ E21B *1/00, 4/10*
U.S. Cl. 175—319 **10 Claims**

1. A well drilling assembly comprising;

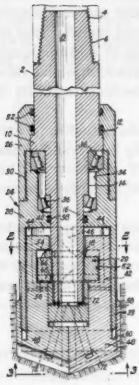
a vertically extending rotatable drive member having a cam fixed to the lower end thereof;

a housing rotatably mounted on the lower end portion of said drive member about said cam;

a plurality of pairs of diametrically opposed and radially extending chisel blades carried by and axially slidable on said housing and having cam follower means thereon;

said cam being configured to sequentially lift said pairs of diametrically opposed chisel blades, one pair at a time, and then forcibly project them downwardly, upon relative rotation between said drive member and housing, while leaving the remaining chisel blades in their lower position;

said cam comprising a cylindrical body concentric to the axis of said drive member and having upper and lower



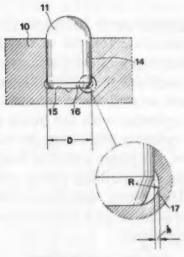
axial end faces; a pair of diametrically opposed camming elements on each of said axial faces.

4,289,211

ROCK DRILL BIT

Karl L. G. Lumen, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Continuation-in-part of Ser. No. 880,993, Feb. 24, 1978, Pat. No. 4,181,187. This application Oct. 11, 1979, Ser. No. 83,664
Claims priority, application Sweden, Mar. 3, 1977, 7702345; Austria, May 28, 1979, 3859/79
Int. Cl.³ E21C *13/00, 13/08*
U.S. Cl. 175—410 **4 Claims**



1. A rock drill bit comprising:

a steel body including a front peripheral surface, said surface having a plurality of holes extending longitudinally inwardly from said surface, said holes each including:

a steel cylindrical wall portion,

a steel bottom wall portion defining the longitudinally inner end of said hole, and

a radially enlarged steel transition wall portion extending between a longitudinally inner end of said cylindrical wall portion and a radially outward end of said bottom wall portion,

a plurality of hard metal inserts mounted in said holes and projecting outwardly of said surface, said inserts each including a side surface comprising:

a cylindrical surface portion directly abutting against said cylindrical wall portion of said hole, said cylindrical surface portion extending longitudinally inwardly at least as far as said longitudinally inner end of said cylindrical wall portion of said hole, and

a radially disposed bottom surface portion defining a longitudinally inner end of said insert,

said transition wall portion of said hole extending from said longitudinally inner end of said cylindrical wall portion of said hole in a direction having at least a radially outward component, then extending in a direction having longitudinally inward and radially outward components, thereafter extending in a direction having longitudinally inward and radially inward components and finally adjoining said bottom wall portion, so as to contain no abrupt concave corners which cause localized stress concentrations in the wall of the hole and subsequent fatique failure therein;

the ratio of:

the radial distance from the cylindrical surface of said insert to the radially outermost part of said transition wall, to

the diameter of said cylindrical surface of said insert,

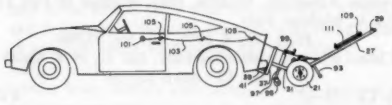
being in the range of from 1:25 to 1:75.

4,289,212

SELF-PROPELLED BATTERY POWERED CART FOR PUSHING DISABLED VEHICLES

Erich A. Immel, 6525 Fairmount Ave., El Cerrito, Calif. 94530

Filed May 29, 1979, Ser. No. 42,990
Int. Cl.³ B62D *51/04*
U.S. Cl. 180—19 R **2 Claims**



1. A battery powered cart for pushing a disabled automobile or other large unpowered vehicle comprising

a frame having a battery and electric drive motor mounted thereon,

an electrical switch means for utilizing current from said battery to activate said electric drive motor,

a transversely disposed axle secured to said frame,

a drive wheel mounted on each of the outer ends of said axle with each drive wheel having a means for engaging said axle,

means engaging the drive shaft of said electric drive motor to said axle whereby rotation of said drive shaft will cause said axle to rotate,

a portion of said frame projecting forward of said axle and being formed for contacting and pushing a vehicle, said forwardly projecting portion including at least two upwardly projecting vehicle push bars which are tubular in shape and which are adapted to slidably receive mating tubular members of an accessory attachment whereby said accessory attachment can be attached to the cart by downward insertion of its tubular members over said upwardly projecting push bars,

said frame and axle being aranged such that upon operation of the cart said portion of said frame contacting the vehicle will make contact at a point that is higher off the ground than the axis of said axle whereby pushing against said vehicle will cause said frame to rotate backwards about said axle whereby a portion of the weight of said vehicle will be imposed on said cart to enhance the frictional contact of the drive wheels with the ground to provide greater traction for pushing said vehicle,

said frame being formed such that the length of the frame from said axle to the vehicle contact point is sufficient to place said contact point above yet relatively close in height to said axle so as to prevent the cart from rotating over backwards about said axle when pushing a vehicle, and

a third wheel rotatably fixed to said frame at a point forward

of said drive wheels to provide an optional third rolling ground contact point to stabilize the rotation of said frame about said axle.

4,289,213

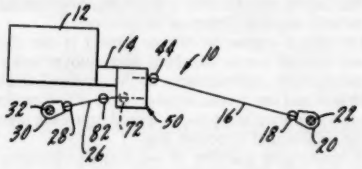
ANGULAR OUTPUT TRANSFER CASE

Robert L. Seaman, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 21, 1979, Ser. No. 106,056

Int. Cl.³ B60K *17/34*

U.S. Cl. 180—233 **17 Claims**



1. Apparatus including a transfer case, said transfer case comprising a housing, an input shaft extending into said housing and supported for rotation on an input axis, a first output shaft extending out of said housing and supported for rotation on a first output axis, an intermediate shaft supported in said housing for rotation on an intermediate axis, means coupling said input shaft with said first output and intermediate shafts for transferring torque therebetween, a second output shaft extending out of said housing and supported for rotation on a second output axis, said intermediate and second output axes determining a fixed angle, a single cardan joint in said housing, said single cardan joint coupling said intermediate and second output shafts and having said fixed angle as its included angle, and yoke means rotatable with and slidable relative to said second output shaft.

4,289,214

MULTI-PURPOSE VEHICLE

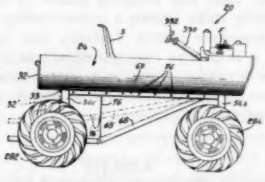
William G. Spence, Airport Rd., Mansonville, Quebec, Canada (J0E 1X0)

Filed Apr. 3, 1978, Ser. No. 892,974

Claims priority, application United Kingdom, Jan. 28, 1978, 03579/78

Int. Cl.³ B60K *17/30*; B60D *1/16*

U.S. Cl. 180—234 **20 Claims**



1. In a multi-purpose vehicle comprising a generally rectangular frame supported by a pair of front wheels and a pair of rear wheels each of said wheels adapted to be driven and steered, said frame having a pair of longitudinally extending frame members and a pair of members transverse to said longitudinally extending frame members comprising a front and a rear frame member, the improvement comprising spaced-apart connecting means formed in each of said longitudinally extending frame members along the length thereof, a tow bar having at least one pair of arms joined at one end of each arm, each of the free ends of said arms being freely pivotally secured respectively in a selected one of said connecting means in each of said longitudinally extending frame members, and flexible means proximate the juncture of said pair of arms and intermediate said free ends of said pair of arms and said pair of rear wheels for selectively varying the division of the vertical force at said juncture of said pair of arms of said tow bar as between said pair of rear wheels and said pair of front wheels.

4,289,215

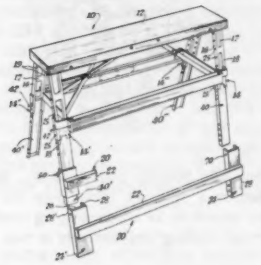
DETACHABLE STEP

David M. Robinson, Margate, Fla., assignor to Goldblatt Tool Company, Kansas City, Kans.

Filed Mar. 20, 1979, Ser. No. 22,309

Int. Cl.³ F16M *11/00*

U.S. Cl. 182—92 **1 Claim**



1. A step structure for attachment to a saw horse having a pair of support legs each in the form of a channel member which includes a front wall with a plurality of openings spaced along the length thereof and a pair of sides projecting from the front wall, said step structure comprising:

a rigid rung;

a pair of support brackets on opposite end portions of said rung, each support bracket being in the form of a channel having a front wall and a pair of sides engagable with the front wall and sides of the corresponding support leg when said brackets are applied to said legs; and

a pin secured to said front wall of each support bracket and projecting above said front wall, said pins being insertable in each of the openings of the support legs to fasten the rung in extension between said support legs at a plurality of elevations, each pin having an L shaped configuration and presenting a horizontal portion extending through the opening and a vertical portion engaging a back surface of the front wall of the support leg to maintain the brackets on said support legs.

4,289,216

DISC BRAKE

Kenji Shirai; Hidetoshi Shimizu, and Junichi Tanoue, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki, Toyota, Japan

Filed Feb. 12, 1980, Ser. No. 120,788

Claims priority, application Japan, Apr. 6, 1979, 54-42355; Jun. 30, 1979, 54-83263

Int. Cl.³ F16D *55/14*

U.S. Cl. 188—72.2 **14 Claims**

1. In a disc brake including

a rotary disc having a friction surface on either side thereof near the periphery;

a pair of braking pad assemblies, each of which composed of a pad member and a backing plate for supporting the same, said backing plate being provided with a torque giving surface;

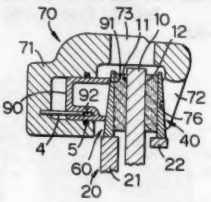
a torque receiving member disposed position-fixedly and provided with torque receiving surfaces abuttable with each of said torque giving surfaces; and

an actuator for urging said pair of braking pad assemblies onto said rotary disc with acting surfaces thereof respec-

tively abuttable on the backing plate of said pair of braking pad assemblies, said disc brake comprising,

a gap between at least one of the friction surfaces of said rotary disc and the acting surface corresponding thereto of said actuator being made progressively larger into a wedge shape toward the axis of said rotary disc;

at least a part of said torque giving surface of the braking pad assembly and said torque receiving surface in confrontation to the same being so slant as to produce a component



for moving said braking pad assembly, in the wedge shaped gap, in a direction away from the axis of said rotary disc caused by an accompanying rotational torque acting on said braking pad assembly in case of brake applying;

a stopper means for regulating the limit of the movement of said braking pad assembly; and

a spring means for biasing said braking pad assembly in a direction toward the axis of said rotary disc.

4,289,217

FRICTION PAD ASSEMBLIES FOR DISC BRAKES

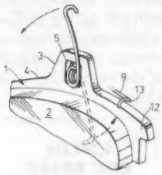
Helmut Heibel, Moschheim, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 20, 1979, Ser. No. 59,174

Claims priority, application United Kingdom, Jul. 28, 1978, 31473/78

Int. Cl.³ F16D *65/02*

U.S. Cl. 188—73.38 **11 Claims**



1. A friction pad assembly comprising a backing plate and a pad of friction material secured thereto, a wire spring with oppositely directed outwardly extending arms connected by a coiled region, being located with the coiled region in a recess in the backing plate, the said arms extending from the recess on opposite sides of the backing plate.

4,289,218

MECHANICAL MOTION-SNUBBING DEVICE

Takayuki Urano, Kanagawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jun. 21, 1979, Ser. No. 50,771

Claims priority, application Japan, Oct. 6, 1978, 53-122729

Int. Cl.³ B60T *7/12*

U.S. Cl. 188—134 **10 Claims**

1. A mechanical motion-snubbing device comprising:

a pair of telescoped members mounted for relative axial movement with respect to each other, said telescoped members being non-rotatable relative to each other about the longitudinal axes thereof;

movement-converting means for converting the relative axial movement of said telescoped members into a rotation;

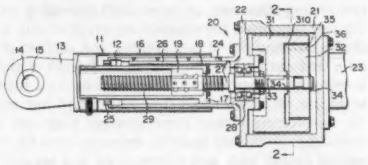
a shaft supported by one of said paired telescoped members so as to be rotated by said movement-converting means, said shaft being axially fixed;

a first inertia member fixed to the shaft;

a second inertia member freely rotatable on an axis of said shaft, said second inertia member being axially fixed and being arranged for unrestrained rotation relative to said first inertia member over a given angle of rotation thereof in both opposite directions of rotation;

a plurality of segmental cutouts formed in one of said first and second inertia members, said cutouts being formed substantially equiangularly in the circumferential direction of said one inertia member, each of said cutouts defining a pair of collision planes spaced from each other in said circumferential direction; and

a corresponding plurality of segmental projections formed on the other of said first and second inertia members



substantially equiangularly in the circumferential direction of said other inertia member so as to fit into respective corresponding cutouts with a predetermined space left therebetween, each of said projections defining a pair of collision planes spaced from each other in said circumferential direction and facing corresponding collision planes of the cutouts, the circumferential spacing between collision planes of a given projection being less than the circumferential spacing between collision planes of the respective cutout by a given distance, said second inertia member being rotatable unrestrained relative to said first inertia member over said given angle which corresponds to said given distance; whereby upon application of sudden opposing external forces exceeding a given value, the first inertia member rotates relative to said second inertia member such that collision planes of each projection alternately strike against a corresponding collision plane of a respective cutout, whereby said inertia members rotate in respective opposite directions in an alternating manner to produce a composite inertia moment of the first and second inertia members to absorb energy of said opposing external forces.

4,289,219

CONTROL SYSTEM FOR VEHICLE BRAKE VALVE

Gregory Csurgay, and Willes W. Reeder, both of Fort Lauderdale, Fla., assignors to Fail Safe Industries, Inc., Lantana, Fla.

Filed Nov. 2, 1979, Ser. No. 90,759

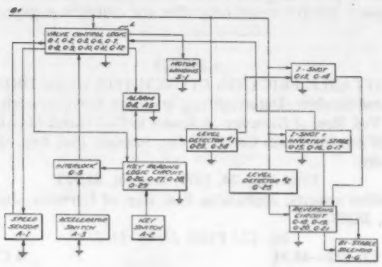
Int. Cl.³ B60K *41/20*

U.S. Cl. 192—2 **29 Claims**

1. In an automotive vehicle brake system having hydraulic brake means, and valve means operatively connected to control the hydraulic pressure in said brake means, said valve means having an open first position in which it is operable either to relieve said hydraulic pressure or to apply a pressure increase to said brake means, said valve means having at least one additional position in which it acts as a one-way check valve operable to apply a pressure increase to said brake means but not to relieve pressure in said brake means, the improvement which comprises:

electrically energizable means for controlling the position of said valve means;

and control circuit means operatively connected to said



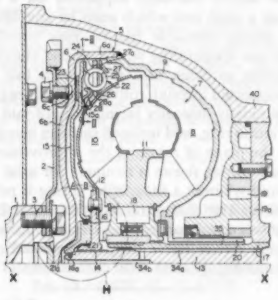
electrically energizable means to effect the positioning of said valve means in said open position when the vehicle is moving and in said additional position after the vehicle stops.

4,289,220

HYDRAULIC COUPLING WITH A LOCK-UP CLUTCH

Kiyoshi Onuma, Toyota, and Hajime Arai, Aichi, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 12, 1979, Ser. No. 84,431
Int. Cl.³ F16D *3/66*
U.S. Cl. 192—3.3 **8 Claims**



1. A transmission comprising:

an input member;

an output member;

a housing mounted to said input member, said housing having a front wall portion including a cylindrical peripheral wall portion, a disk-shaped end wall portion and a rear portion formed as an impeller, said end wall portion having an annular portion which operates as a first clutch member;

a turbine received in said housing between said end wall portion and said impeller and drivingly connected to said output member;

a disk provided between said end wall portion of said housing and said turbine so as to define a first chamber between said disk and said end wall portion and a second chamber between said disk and said turbine, said disk having an annular portion which operates as a second clutch member;

a buffering means provided between outer peripheral portions of said disk and said turbine, said buffering means drivingly connecting said outer peripheral portions with each other;

a first fluid passage for communicating fluid to said first chamber; and

a second fluid passage for communicating fluid to said second chamber;

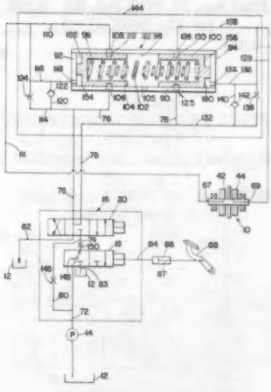
said buffering means comprises a first annular plate element mounted to said outer peripheral portion of said turbine and having first and second circumferentially elongated openings, second and third annular plate elements having individually third and fourth circumferentially elongated openings and frictionally engaged on opposite faces of said first annular plate element and connected with each other by a pin which is passed through said first opening so as to allow for a predetermined frictional relative rotary movement between said first annular plate element and the combination of said second and third annular plate elements, and a compression coil spring located in said second, third, and fourth opening so as to be supported and to effect a buffering connection between said first annular plate element and the combination of said second and third annular plate elements, said disk being directly connected to the combination of said second and third annular plate elements so as to be bufferingly connected to said turbine through the assembly of said first, second, and third annular plate elements and said coil spring.

4,289,221

HYDRAULIC CONTROL SYSTEM

J. Bruce Chambers, Yardley, Pa., and Richard J. Dotter, Sr., Trenton, N.J., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 17, 1978, Ser. No. 961,891
Int. Cl.³ F16D *25/10*
U.S. Cl. 192—3.57 **9 Claims**



1. In a control system for actuating a pair of dependent hydraulic clutches, said clutches comprising a first clutch piston, means defining a first pressure chamber behind said first clutch piston, a second clutch piston, means defining a second pressure chamber behind said second clutch piston, and means connecting said first and second clutch pistons whereby both clutch pistons move in response to pressurization of either of said first and second pressure chambers; a source of pressurized hydraulic fluid; a shift valve operable to selectively connect said source with said first and second pressure chambers, an accumulator valve assembly operable to control the flow of pressurized hydraulic fluid from said shift valve to said first and second pressure chambers; and conduit means connecting said source to said shift valve, said shift valve to said accumulator valve and said accumulator valve to said first and second chambers; the improvement wherein said accumulator valve assembly comprises a valve body; a first accumulator piston received within said valve body for controlling fluid flow to

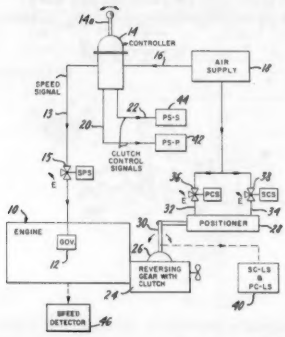
said first pressure chamber; a second accumulator piston received within said valve body for controlling fluid flow to said second pressure chamber, said first and second accumulator pistons being disposed in back-to-back relationship within a cylindrical bore formed in said valve body; means defining first and second inlet ports formed through said valve body into said cylindrical bore; means defining first and second outlet ports formed through said valve body into said cylindrical bore; means formed on said first accumulator piston for connecting said first inlet and outlet ports when said first accumulator piston is in a first position, for blocking flow between said first inlet and outlet ports when said first accumulator piston is in a second position, and for reconnecting said first and second inlet and outlet ports when said first accumulator piston is in a third position; means formed on said second accumulator piston for connecting said second inlet and outlet ports when said said accumulator piston is in a second position, for blocking flow between said second inlet and outlet ports when said second accumulator piston is in a second position, and for reconnecting said second inlet and outlet ports when said second accumulator piston is in a third position; and a first spring received between said first and second accumulator pistons to bias said pistons apart in said bore; said system including first and second inlet conduit means connecting said shift valve with said first and second inlet ports respectively, first outlet conduit means connecting said first outlet port with said first clutch pressure chamber, and second outlet conduit means connecting said second outlet port with said second clutch pressure chamber.

4,289,222

ENGINE-CLUTCH CONTROL INTERLOCK SYSTEM

William F. Esthimer, Walpole, Mass., assignor to Bird-Johnson Company, Walpole, Mass.

Filed Sep. 27, 1979, Ser. No. 79,595
Int. Cl.³ B60K *41/02*
U.S. Cl. 192—0.033 **3 Claims**



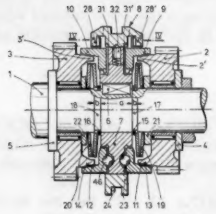
1. In a power train that includes an engine having an engine speed control means for controlling the speed of the engine in response to an engine speed control signal generated and selectively conducted to the speed controller and a clutch having a clutch control means for engaging and disengaging the clutch in response to a clutch actuator signal, an engine and clutch control interlock system comprising means for monitoring engine speed and producing a speed signal indicative of whether the engine is running at a speed above or below a selected nominal idle speed; means for generating and monitoring a clutch control signal and producing a clutch control status signal indicative of whether or not a clutch control signal is being generated; means for monitoring the operating status of the clutch and producing a clutch status signal indicative of whether the clutch is engaged or disengaged; means responsive to the clutch control status signal and the speed signal for conducting the clutch actuator signal to the clutch control means of a disengaged clutch only when a clutch control signal is generated and the engine is running below the nominal idle speed; and means responsive to the clutch status signal for permitting a speed control signal to be conducted to the speed control means only after the clutch is engaged.

4,289,223

SHIFTABLE FRICTION CLUTCH FOR GEAR DRIVES

Richard Strehler, Unterfoehring, and Max Bartl, Munich, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed May 24, 1979, Ser. No. 41,923
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1978, 2828722
Int. Cl.³ F16D *21/04, 43/21*
U.S. Cl. 192—48.91 **4 Claims**



1. In a shiftable friction clutch for gear drives comprising a shift collar axially movably supported on a carrier sleeve mounted on a shaft and which must be coupled to a gear, at least one axially movable friction ring constituting a first clutch half and cooperating with a second clutch half through clutch friction surfaces, said first clutch half being axially movably supported through rolling elements engaging inclined surfaces on axially mutually facing sides of said carrier sleeve and said friction ring, said inclined surfaces being inclined with respect to the plane of rotation, the improvement comprising wherein said carrier sleeve is mounted for axial movement on said shaft and wherein a supporting spring is provided on the side of said carrier sleeve remote from said clutch friction surfaces between said carrier sleeve and said shaft for limiting the maximum transmittable torque when said clutch friction surfaces are in engagement with each other.

4,289,224

INDEPENDENT WHEEL DRIVE

Dale R. Dobberpuhl, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Sep. 4, 1979, Ser. No. 72,272
Int. Cl.³ F16D *41/16;* B60K *23/06*
U.S. Cl. 192—50 **2 Claims**

1. A drive system mounted to a vehicle, said drive system in communication with the vehicle power unit, comprising:

(a) a first axle rotatably mounted to said vehicle;

(b) a second axle rotatably mounted to said vehicle;

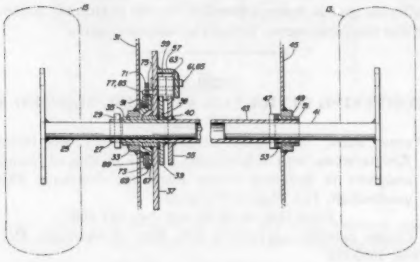
(c) a first sprocket fixably mounted around a portion of said first axle;

(d) a second sprocket fixably mounted around a portion of said second axle;

(e) a main sprocket rotatably mounted around a portion of one of said axles, said main sprocket in communication with said vehicle power unit such that said vehicle power unit can cause said main sprocket to rotate, said first, second, and main sprocket being mounted generally parallel to each other;

(f) a first pawl rotatably mounted to said main sprocket and positioned to enable a driving engagement with said first sprocket;

(g) a second pawl rotatably mounted to said main sprocket and positioned to enable a driving engagement with such second sprocket;
(h) a first friction disk;
(i) a second friction disk placed beside said first friction disk;
(j) a ring having retaining wall and fixably mounted around one of said axles, said first and second friction disk rotatably mounted around said ring, one of said disk to abut said retaining wall;
(k) a compressing means for pressing said disk against each other and said retaining wall;
(l) a first pin fixably mounted to said first pawl, said pin to extend through said first enlarged opening in said main



sprocket and entering an opening in said first friction disk, such that said first pin can cause said first pawl to rotate;
(m) a second pin fixably mounted to said second pawl, said pin to extend through a second enlarged opening in said main sprocket and entering an opening in said second friction disk, such that said second pin can cause said second pawl to rotate;

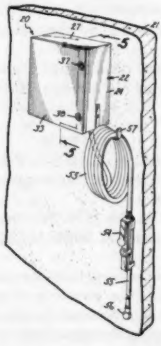
whereby rotation at said main sprocket causes first and second pins in cooperation with said first and second friction disk to rotate said first and second pawls sufficient to engage the respective first and second sprockets, by advancing one of said axles relative to said other axle said advanced axle is allowed to free-wheel by revising the influence of hard friction disk to cause disengagement of said pawl.

4,289,225

AIR COMPRESSOR AND DISPENSER

Owen R. Scholta, Burnsville, Minn., assignor to Thorne Industries, Inc., Bloomington, Minn.

Filed Mar. 12, 1979, Ser. No. 19,869
Int. Cl.³ G07F *15/12, 17/06*
U.S. Cl. 194—9 T **8 Claims**



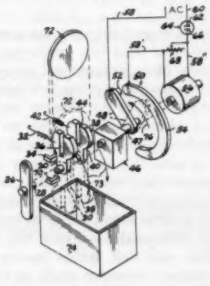
1. An apparatus for compressing and dispensing compressed gas comprising:
a housing adapted to be secured to a support, said housing having a chamber, a doorway open to the chamber, door means movably mounted on the housing for closing the doorway, lock means cooperating with the door means for holding the door means in a closed position covering the doorway, holding the door means in a closed position covering the doorway,
an electric motor located in the housing chamber,
means mounting the motor on the housing,
gas compressor means located in the chamber and drivably connected to the motor,
said gas compressor means and said motor having communicating passages therethrough for directing cooling gas into proximity to said gas compressor means and said motor,
said gas compressor means having a guide for directing gas into said passages of the compressor means, and also having intake means for gas to be compressed open to said chamber,
said housing having a bottom wall, a gas inlet opening in said bottom wall located adjacent the guide for directing gas into the gas compressor means,
said motor having gas impelling means for carrying cooling gas from the guide through the gas compressor and motor and discharging the gas therefrom into said chamber,
said gas in the chamber being drawn into the gas intake means on operation of said gas compressor means,
conduit means connected to the gas compressor means to carry compressed gas to a desired location externally of said housing,
control means located in the housing chamber operable to connect the motor to an electric power source whereby the motor operates the gas compressor means to compress gas and deliver gas to the desired location,
said control means including switch means and coin operated timer means to operate the switch means a limited period of time in response to actuation of the timer means with a coin, and means mounting the control means on the housing.

4,289,226

ELECTRIC VEHICLE BATTERY RECHARGING STATION

Rudolph P. Wilkinson, 320 Lincoln Center, Ardmore, Okla. 73401

Filed Dec. 3, 1979, Ser. No. 99,244
Int. Cl.³ G07F *15/12*
U.S. Cl. 194—84 **4 Claims**



1. An electric energy vending apparatus, comprising:
a closed housing having a coin slot for receiving coins or tokens;
normally open circuit means including a switch having a movable contact slidably contacting an arcuate stationary contact contained by said housing and including leads connected with a source of electrical energy;
an electrical outlet having terminals interposed in said circuit means;

coin receiving means including first and second coin or token nesting levers manually rotatable in one direction through a first predetermined arc for closing said circuit means,

said coin receiving means including first and second rods coaxially journalled horizontally by said housing and respectively connected at one end with one end portion of said first and second levers, respectively,

a gear train connected with the other end of said second rod,

a driven shaft connecting said gear train with said movable switch contact for movement of the latter through a second predetermined arc as a function of the angular rotation of said levers, and,

spring means normally biasing said first and second levers toward a coin or token receiving position; and,

wattmeter means interposed in said circuit and drivably connected with said driven shaft for biasing said switch open after a predetermined time interval.

4,289,227

BELT CONVEYER TRANSPORTATION SYSTEM UTILIZING MAGNETIC ATTRACTION

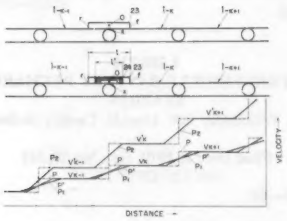
Kazumi Matsui, Yokohama; Takashi Takasue, Kawaguchi, and Masami Iwasaki, Tokyo, all of Japan, assignors to Furukawa Electric Co. Ltd., Tokyo, Japan

Division of Ser. No. 791,141, Apr. 26, 1977, Pat. No. 4,197,934. This application Aug. 29, 1979, Ser. No. 70,823

Claims priority, application Japan, Apr. 28, 1976, 51-47880; May 25, 1976, 51-59590; Jun. 15, 1976, 51-69276; Jul. 6, 1976, 51-79426; Aug. 25, 1976, 51-100647; Sep. 30, 1976, 51-116509; Oct. 6, 1976, 51-119313; Oct. 12, 1976, 51-121341; Nov. 10, 1976, 51-134185; Jan. 11, 1977, 52-1133

Int. Cl.[3] **B65G** *17/00;* **B61B** *13/14;* **B61K** *1/00*

U.S. Cl. 198—334 **5 Claims**



1. A belt conveyor type transportation system by magnetic attraction comprising at least one conveyor line including a plurality of conveyor units arranged successively, each of said conveyor units comprising endless belt means including a magnetic material as a constituent element encircled around on a pair of a driving wheel and idle wheel to be driven thereabout at a respective speed independent of the speeds of the other units, and at least one moving body disposed on said conveyor line, said moving body including magnet means for magnetically attracting said magnetic belts, whereby said moving body is moved forcibly along said conveyor line by following the circulating speed of the magnetic belt means of each of said conveyor units, said belt means having a length corresponding to the distance between shafts at both ends of conveyor units and being equal to the length of said magnet means for attaining linear, continuous acceleration without frictional slippage, said magnet means being constantly energized to produce magnetic attraction strong enough to overcome the friction force due to the load added to the magnet belt means by the magnet means, said magnet means being attracted by magnetic force towards the surface of the magnet belt means and being in facing relation therewith at less than a predetermined gap, said magnet means being constructed so that magnetic attaction between two conveyor units is made when the magnet means passes through a portion between the two conveyor units, the ratio of the magnetic attraction between the two units varying gradually with the movement of the magnet means, such that when the velocities of the magnetic belts of both units are different, the velocity of the moving body is varied linearly and gradually from the velocity of one unit to the velocity of the other unit accompanied with slip wherein a plurality of said conveyor lines each including said moving body and a plurality of said conveyor units having, in terms of their own magnetic belt speeds, steplike speed differences with one another, are arranged along at least one side of a car travel line of a continuously operated transportation system, the traveling distance of the moving body required for the moving body speed to synchronize with the conveyor units having different speeds being dependent on the positional dimension of the magnetic means facing the magnetic belt.

4,289,228

CONVEYING DEVICE FOR A PACKING MACHINE OR THE LIKE

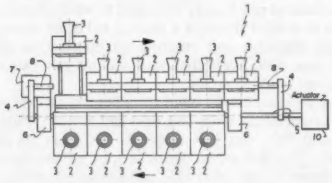
Werner Reim, Waldbronn; Hermann Gernlein, and Helmuth Zimmermann, both of Karlsruhe, all of Fed. Rep. of Germany, assignors to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 101,298

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853103

Int. Cl.[3] **B65G** *47/00*

U.S. Cl. 198—339 **8 Claims**



1. A device for the intermittent conveyance of articles, comprising first and second parallel spaced apart linear guideways facing at an angle to each other, a plurality of cassettes, each adapted to receive an article slidably mounted on said first and second guideways, and means for intermittently displacing said cassettes linearly along said guideways and for tilting said cassettes from one of said guideways to the other, whereby said cassettes move cyclically on the device, said means for intermittently displacing and tilting said cassettes comprising a shaft extending parallel to said first and second guideways, an actuator for moving said shaft linearly along its axis and for rotating said shaft about its axis, and arm means connected at each end of said shaft and engageable with said cassettes for displacing and tilting said cassettes.

4,289,229

CONVEYOR TABLE SLAB STOP ARRANGEMENT

Norman L. Keller, Pittsburgh, Pa., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 26, 1979, Ser. No. 88,497

Int. Cl.[3] **B65G** *13/075*

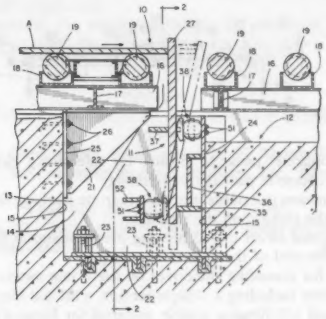
U.S. Cl. 198—633 **25 Claims**

12. For a conveyor arrangement having a plurality of horizontally spaced conveyor members adapted to support and convey products in a horizontal direction, an improved stop mechanism for stopping the movement of said products comprising:

a stop element mounted on said arrangement vertically movable between a first blocking position for stopping the movement of said products and a second non-blocking position,

actuating means for moving said stop element between said blocking and non-blocking positions, and

shock absorbing means in the arrangement engaging said stop element comprising horizontally spaced elastomeric shock absorbers disposed on opposite sides of said stop element,



means operatively associated with the stop element and providing for horizontal displacement of the stop element upon impact thereof by the products,

whereby blocking of said products by said stop element horizontally displaces the upper portion of said stop element transmitting shock forces thereby generated to said shock absorbing means.

4,289,230

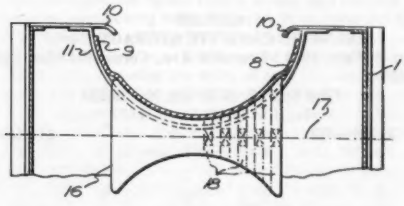
TROUGHED BELT CONVEYORS

Terence McGee, 7 Weaver St., Kirkstall Rd., Leeds 4, Yorkshire, England

Filed Jan. 19, 1978, Ser. No. 870,796

Int. Cl.[2] B65G *15/60, 15/08*

U.S. Cl. 198—811 **7 Claims**



1. A troughed belt conveyor comprising an endless travelling belt supported in its load carrying stretch upon a skid base which is curved in cross-section to cause the belt to assume an upwardly concave cross-sectional shape, the belt being arranged to travel along and in sliding contact with said base, waisted rollers located at least adjacent the infeed and outfeed ends of the said base, said waisted rollers having their concave surfaces projecting sufficiently above the skid base to support the belt at those locations slightly clear of said skid base, said skid base being provided along its length with a first series of spaced apart cut-outs through which project horizontally disposed rollers, and a second series of cut-outs through which project inclined rollers, said second series of cut-outs and their inclined rollers alternating with said first series of cut-outs along the length of the skid base and said second series comprising pairs of opposed cut-outs located on opposite sides of the skid base, said horizontally disposed rollers and said inclined rollers supporting the endless belt clear of the skid base at selected points and being carried by means secured to said skid base.

4,289,231

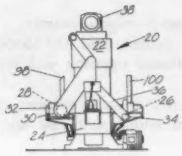
ARTICLE FEEDING APPARATUS

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Jul. 12, 1979, Ser. No. 56,835

Int. Cl.[3] B65G *23/06*

U.S. Cl. 198—834 **9 Claims**



9. In an apparatus having a belt passing over at least two cylindrical drums, and having means for intermittently driving one, at least, of said drums for feeding a series of articles along a path so as to present them in succession to a plurality of operating stations where operations are performed on said articles in sequence, said belt having a series of equally spaced article receiving apertures to fit said articles; one of said drums constituting a low inertia idler drum comprising a pair of spaced side plates fixed to a non-rotatable shaft, opposed coaxial pairs of first roller bearing means mounted on said side plates, the axes of said first roller bearing means being substantially parallel to the axis of said non-rotatable shaft, said opposed coaxial pairs of first bearing means comprising three coaxial opposed pairs of roller bearings mounted 120° apart around said plates, a sleeve rotatably mounted around said first roller bearing means, said sleeve being provided with a peripheral flange at both edges thereof and with axially aligned sprocket teeth about its periphery so that no slippage can occur between said belt and said idler drum, and opposed pairs of second roller bearing means bearing against said peripheral flanges of said sleeve, to provide axial guiding of said sleeve, and having axes substantially perpendicular to the axis of said shaft, said opposed pairs of second idler bearing means comprising three opposed pairs of roller bearings mounted 120° apart around said side plates.

4,289,232

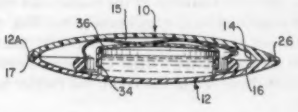
DIAPHRAGM CASE OR THE LIKE

Paula Seibel, 307 W. 105th St., Apt. 4B, New York, N.Y. 10025, and Wayne J. Stettler, Philadelphia, Pa., assignors to Paula Seibel, New York, N.Y.

Filed Jun. 20, 1979, Ser. No. 50,343

Int. Cl.[3] A45C *11/00;* **B65D** *85/16*

U.S. Cl. 206—37 **1 Claim**



1. A diaphragm case, comprising:

top and bottom closure halves, each said half having the approximate external shape of a shell and including:

(a) an internal circular depression

(b) a flat ledge around said depression, with the flat ledges of the two sections adapted to engage each other when the case is closed,

(c) a vertically displaced section shaped to conform generally to the edge of a shell at the front of each closure half, each of said displaced sections forming in conjunction

with the opposite closure half a shell like construction when closed, and

(d) a locking projection on the flat ledge adapted to snap engage a complementary depression in the vertically displaced section of the other half,

an integrally formed container extending upwardly from the center of the bottom section and adapted to hold a contraceptive ointment,

air-tight closure means for said container,

means for pivotally securing said half sections together, said means being positioned opposite said vertically displaced sections,

a contraceptive ointment in said container, and

a flexible diaphragm within said case and enveloping said container.

4,289,233

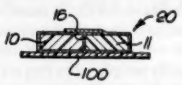
PACKAGING OF MUTUALLY REACTIVE SUBSTANCES

Francis G. Firth, Los Angeles, Calif., assignor to Applied Plastics Co., Inc., El Segundo, Calif.

Continuation of Ser. No. 905,449, May 12, 1978, abandoned, which is a division of Ser. No. 747,612, Dec. 6, 1976, Pat. No. 4,116,742. This application Oct. 15, 1979, Ser. No. 85,128

Int. Cl.[3] **B65D** *81/32, 25/08*

U.S. Cl. 206—221 **3 Claims**



1. A plastic hand kneadable package comprising

(a) first and second extruded, mutually reactive self-supporting plastic masses which are kneadable together, said first mass consisting essentially of an admixture of filler, thixotropic material and reactive epoxy resin having an epoxy equivalent weight of 190 or less, the second mass consisting essentially of a reactive, non-flowing admixture of a polyfunctional amine and filler,

(b) said masses extended in close side-by-side horizontally spaced apart relation, the masses being lengthwise elongated in parallel relation and having rectangular cross sections, and

(c) a thin, flexible barrier between said masses blocking them against touching one another until such time as the masses are intentionally kneaded together for reaction, the barrier being in sprayed-on dried film state and being coated on a vertical side of at least one of the masses, the masses horizontally separated by the thickness of the film, the barrier characterized as essentially impermeable to reactive ingredients in the masses, the barrier consisting essentially of a film former dissolved in a solvent, the barrier being elongatable,

(d) the barrier having a thickness characterized as resulting from spray application only of the barrier onto at least one vertically extending side of one of the self-supporting masses while said one mass is progressively advancing relative to the spray, the barrier having a height dimension at least several times greater than the barrier thickness, the barrier height dimension being the same throughout the lengths of the masses,

(e) and a wrapping about said masses and barrier and having overlapping extents accessible adjacent flat surfaces of the masses which extend toward the barrier.

4,289,234

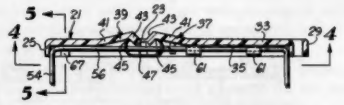
CIGARETTE PACKAGE CLOSURE

Roger M. Rutschke, Laguna Beach, Calif.

Filed Jun. 16, 1980, Ser. No. 160,141

Int. Cl.[3] **A25F** *15/00, 27/00;* **B65D** *85/10, 43/24*

U.S. Cl. 206—259 **10 Claims**



1. A cigarette package closure for selectively closing one end of a cigarette package comprising:

frame means insertable into the cigarette package for installing the closure on the package;

a one-piece cover of self hinging plastic material for covering the end of the cigarette package;

means for mounting the cover on the frame means;

said cover including a closure section, a lid and hinge means of said self-hinging plastic material for hingedly joining the lid to the closure section for pivotable movement between a closed position in which the lid assists in closing the end of the cigarette package when the closure is installed on the cigarette package and an open position in which the lid exposes a portion of the end of the cigarette package when the closure is installed on the cigarette package;

said cover having an outer surface and an inner surface, said inner surface having first and second inner surface regions located so that by urging such inner surface regions in a predetermined direction relative to each other, the lid is urged toward the open position;

spring means confronting the inner surface for urging the inner surface regions in said predetermined direction whereby the lid is biased toward the open position; and

releasable latch means at least partially on the lid for releasably retaining the lid in the closed position.

4,289,235

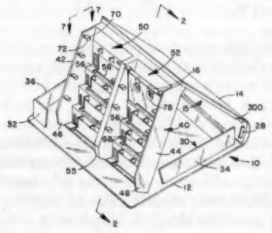
MAGNETIC CASSETTE STORAGE CASE

Robert A. Egly, 1630 Marguerite Ave., Corona del Mar, Calif. 97625

Filed Sep. 17, 1979, Ser. No. 76,252

Int. Cl.[3] **B65D** *85/67, 5/50*

U.S. Cl. 206—387 **13 Claims**



1. A container for holding magnetic memory cassettes comprising:

a first cover;

a second cover hinged to said first cover;

an insert pivotally attached to one of said covers to allow said insert to be folded inwardly between said first and second cover having a plurality of ledges upon which said cassettes can rest;

a web between said first and second cover forming a hinge-

like member therebetween so that the covers can be folded inwardly and opened outwardly;

a wall on one of said covers surrounding at least a portion of the periphery thereof on the internal side between said covers in their overlying relationship for purposes of surrounding the insert at least in part;

backing for receiving cassettes thereagainst when they are on said ledges; and,

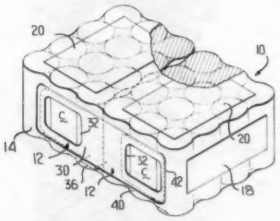
protuberances for frictionally engaging a portion of said cassettes when they are placed on said ledges.

4,289,236

CASE CAN PACKAGE AND METHOD OF FORMING SAME

Robert H. Ganz, Saddle River, and John H. Myers, Emerson, both of N.J., assignors to Ganz Brothers, Inc., Bergenfield, N.J.

Filed Sep. 26, 1979, Ser. No. 79,050
Int. Cl.³ B65D *75/38*; B65B *53/02*; B65D *85/62*
U.S. Cl. 206—432 **9 Claims**



4. A case can package comprising two one-half case can packages disposed in side by side relation, said one-half case can packages being identical and each one-half case can package including cans arranged in rows and columns and a package film surrounding said cans and shrunk tightly around said cans in interlocking relation therewith to form a readily handleable unit, and an overwrap film surrounding two one-half case can packages and shrunk tightly around said one-half can packages in interlocking relation therewith to form a readily handleable case can package, and a selected one of said package film and said overwrap film having a surface with a resist coating thereon opposing the other of said films and substantially preventing bonding of said overwrap film to said package films whereby said overwrap film is readily removable from said one-half case can packages without damaging said package films, the package film of each of said one-half case can packages defining at opposite ends thereof an open area, and said overwrap film defining at opposite ends of said case can package a similar opening generally aligned with said package film openings and of a greater height and width.

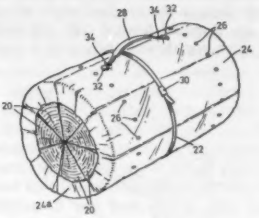
4,289,237

FIREWOOD PACKAGE

Anthony Cutrara, 76 Montressor Dr., Willowdale, Ontario, Canada (M2P 1Z4)

Filed Nov. 20, 1979, Ser. No. 96,107
Int. Cl.³ B65D *85/20*
U.S. Cl. 206—443 **8 Claims**

1. A firewood package comprising: a plurality of lengths of firewood arranged generally parallel to one another; a strap tightly encircling said firewood lengths and holding the same together to form a unitary bundle of generally cylindrical shape, the firewood lengths being sized so that said bundle can be conveniently carried; a film of a plastic material secured around the generally curved surface of the bundle and extending around peripheral regions only of opposed ends of the bundle, the remainder of said bundle ends being exposed to atmosphere, said film being formed with a plurality of perforations to permit air circulation into and through the bundle by way of said perforations and open ends of the bundle; and a carrying handle attached to said bundle; and a carrying handle



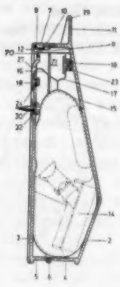
attached to said bundle and accessible from externally of the film of plastic material for facilitating carrying of the bundle.

4,289,238

READINESS RECEPTACLE FOR RESPIRATORS

Ernst Warncke, Lübeck; Joachim Schlobohm, Oldesloe, and Jürgen Behnke, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 4, 1979, Ser. No. 81,936
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843652
Int. Cl.³ B65D *3/26, 77/30*
U.S. Cl. 206—527 **13 Claims**



1. A readiness receptacle for housing a device such as a respirator which comprises a first shell portion hingedly connected to a second shell portion, said connected shell portion defining a space in which the device is disposed in a tearable bag closed on all sides, at least one of said shell sections being pivotable to open said receptacle, a tear strap connected to said tearable bag having a portion connected to each of said shell portions for tearing open said tearable bag, means on one of said shell portions for mounting said receptacle on a wall structure, a handle on the other of said shell portions being engageable to pivot at least one of said shell portions to simultaneously open said receptacle and tear open said tearable bag, and a latch means for latching said shell portions together.

4,289,239

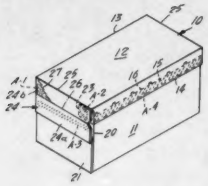
CARTON HAVING NOVEL END PANEL CONSTRUCTION

George L. Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 884,193, Mar. 7, 1978, Pat. No. 4,203,355. This application Jan. 10, 1980, Ser. No. 110,835
Int. Cl.³ B65D *5/18, 5/28, 5/54, 5/66*
U.S. Cl. 206—625 **7 Claims**

1. A fully assembled, unopened, carton of the type provided with a bottom wall panel, opposed front and rear wall panels,

end wall panels, and a top closure panel, each said end wall panel being defined by a pair of folded overlapped flaps on ends of said front and rear wall panels and a flap on said bottom wall panel folded onto said overlapped flaps; said carton comprising: closure flaps on the opposed edges of said top closure panel which are disposed toward said end wall panels, said closure flaps extending downwardly over a portion of corresponding ones of said folded flaps on said front, rear, and bottom wall panels, and terminating at free edges of said closure flaps; closure flap extensions abutting said free edges of said closure flaps and extending downwardly over additional portions of said folded flaps; and means affixing each said closure flap extension on the corresponding one of said end wall panels, to those of said additional portions which lie immediately adjacent said closure flap extensions.



4,289,240

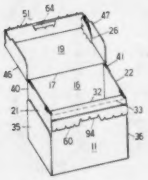
FLIP-LOCK RECLOSABLE CARTON

David C. Mueller, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 1, 1979, Ser. No. 80,550

Int. Cl.³ B65D *5/54, 5/66*

U.S. Cl. 206—624 **12 Claims**



1. A carton having a cover portion which is hingedly reclosable over a receptacle portion, comprising:

(a) a front receptacle panel having top, bottom and side edges;

(b) a pair of receptacle end panels connected at their front edges to the side edges of said front panel and extending rearwardly therefrom with their top edges at the top edge of said front panel;

(c) a bottom receptacle panel having front, rear, and side edges and being connected at its front edge to the bottom edge of said front panel and extending rearwardly therefrom;

(d) a rear receptacle panel having top, bottom and side edges and being connected at its bottom edge to the rear edge of said bottom panel and extending upwardly therefrom;

(e) a relatively narrow reinforcing flap hingedly connected to the top edge of said front panel along the length thereof and extending rearwardly therefrom;

(f) a top cover panel having front, rear, and side edges and being hingedly connected at its rear edge to the top edge of said rear panel and extending frontwardly therefrom;

(g) a front cover flap having top, bottom, and side edges and being connected at its top edge to the front edge of said top panel and extending downwardly therefrom over a portion of said front panel; and

(h) an extension flap connected to the bottom edge of said front cover flap and lying between said front cover flap and said front panel and being secured to said front panel along its length, a centrally disposed portion of said extension flap being connected to said front flap by a hinge line and being bounded by a cut line of weakness in said extension flap to define a locking tab which is not secured to said front panel, the remainder of said extension flap being connected to said front cover flap by a cut line of weakness.

4,289,241

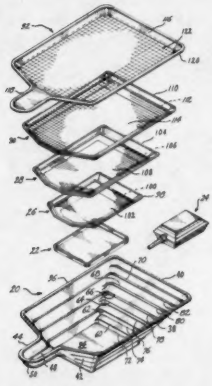
GOLD PAN AND CLASSIFIER

Jay J. Litrap, 3207 Belvidere SW., Seattle, Wash. 98126

Filed Mar. 10, 1980, Ser. No. 128,514

Int. Cl.³ B07B *1/32*

U.S. Cl. 209—44 **25 Claims**



1. A container for separation of a first granular material from a second granular material having a specific gravity less than said first granular material comprising:

a generally rectangular base portion having a forward end and a rearward end, the longitudinal dimension of said base lying in the fore and aft direction of said base,

a pair of side panels joined to and extending divergently upwardly from opposite longitudinal sides of said base,

a front panel joined to and extending upwardly and forwardly from the forward end of said base, said front panel increasing in width as it extends upwardly in proportion to the divergency of said side panels, the forward edge portions of said side panels being joined to respective ones of the side edge portions of said front panel, said front panel having a plurality of ridges and valleys extending thereacross, each of said valleys having a substantially constant depth relative to an adjacent ridge, the ridge lines of said ridges being substantially parallel to each other and substantially parallel to the corner junction between said front panel and said base, and

a rear panel extending upwardly from the rearward edge of said base, said rear panel increasing in width as it extends upwardly in proportion to the divergency of said side panels, the side edge portions of said rear panel being joined to respective rearward edge portions of said side panels.

24. A method for separating a mixture of a first granular material and a second granular material having a specific gravity less than that of the first material comprising the steps of

confining said mixture in a trough-like container in an elongated mass having a relatively flat upper surface and a longitudinal axis,

covering said mixture with water and vibrating said container to cause said first material to settle toward the

bottom of said trough-like container, leaving the second material adjacent the flat upper surface thereof,

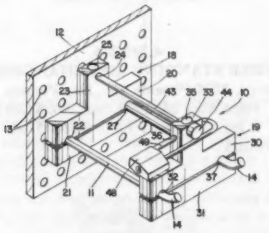
confining said water over and adjacent said mixture so that, as said container is moved, the water passes over said mass in a direction generally orthogonal to the longitudinal axis of said mass, said water alternately running off said mass in a layer having a uniform depth along the longitudinal extent of said mass, and running over said mass in a layer having a relatively uniform depth along the longitudinal extent of said mass, said water as it runs off said mass carrying at least a portion of said second material from the top of said mass.

4,289,242

DISPLAY SECURITY DEVICE

David L. Kenyon, 1727 W. Royalton Rd., Broadview Hts., Ohio 44147

Filed Aug. 31, 1979, Ser. No. 71,777
Int. Cl.³ A47F *5/00*
U.S. Cl. 211—4 **11 Claims**



1. A security device for use with a hanger extending from a board, the device comprising:

two split bar units mounted on the hanger, one bar unit mounted near the end of the hanger adjacent to the board, the other bar unit mounted on the hanger near the opposite end thereof, each split bar unit comprising two bar portions secured together by releasable fastening means, each bar unit having a passage extending therethrough;

a removable rod inserted through the passage in each bar unit and extending between the bar units, the rod preventing release of the fastening means; and

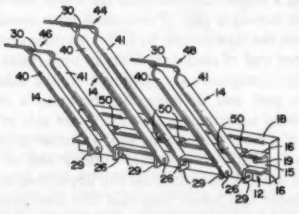
lock means for preventing removal of the rod from the passages in the bar units.

4,289,243

SUPPORT DRIVE PRIMARILY DESIGNED FOR FOOTWEAR

Nicholas A. Arbuzoff, P.O. Box 885-ONECO, Bradenton, Fla. 33558

Filed Jan. 8, 1979, Ser. No. 1,674
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—35 **2 Claims**



1. A support device of the type primarily designed to dispose footwear in exposed, supported position for drying, said support device comprising: base means dimensioned and configured for secure mounting engagement with a predetermined surface, a plurality of pairs of spaced support arms disposed in spaced relation along the length of said base means, each one of said pairs of support arms individually secured to said base and disposed to extend outwardly therefrom in spaced relation to said base means, each of said support arms comprising a substantially elongated, generally flat, rectangular configuration, each of said support arms pivotally connected substantially adjacent one end thereof and comprising a footwear engaging distal end at the opposite end thereof and movable in a plane disposed substantially transverse to the longitudinal axis of said base means between an open and a closed position, said open position defined by outward, angularly oriented disposition of said arms relative to said base means, said closed position defined by a substantially co-planar relation between the longitudinal axis of said support arms and said base means, each of said support arms having a substantially 90° twist formed therein about its longitudinal axis substantially adjacent said footwear engaging distal end so that said distal end lies on a plane orthogonally disposed to said plane disposed substantially traverse to the longitudinal axis of said base means, the portion of each said support arm intermediate its distal end and said twisted portion angularly disposed relative to the longitudinal axis of said support arm so that it lies in a substantially horizontal plane thereby support footwear in an optimal position to achieve maximal drinage and hence quick drying, and whereby the major portion of said support arm resists warping due to its specific orientation parallel to said plane disposed substantially transverse to the longitudinal axis of said base means, said base means comprises a laterally extending base wall and at least two side walls connected to and extending outwardly from said base wall to thereby define a substantially laterally extending elongated channel means extending between said side walls along a major portion of the length thereof, said side walls disposed in vertically spaced relation therebetween so that one of said side walls lies in a horizontal plane spaced upwardly of the other of said side walls lying in a horizontal plane parallel thereto, at least one pair of longitudinally spaces support arm receiving slots formed in said upper one of said side walls, each of said slots complementally formed relative to said support arms to snugly receive predetermined ones of said support arms, said lower wall having at least one pair of longitudinally spaced depending mounting flanges in substantial vertical alignment with predetermined ones of said slots so that each of said pairs of support arms is pivotally connected substantially adjacent one end thereof to predetermined ones of said depending mounting flanges to the end that disposing said support arm in a substantially upstanding or closed position results in said support arms being folded transversly into said channel means and being snugly longitudinally spaced slots individual to each support arm.

4,289,244

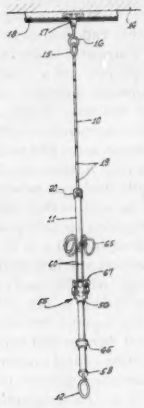
SUPPORTING APPARATUS FOR MEDICAL BOTTLES AND THE LIKE

Douglas L. Frankhouser, Fountain Valley; Louis Schnitz, and Joseph C. Greenstadt, both of Los Angeles, all of Calif., assignors to The Lightron Corporation, Huntington, N.Y.

Filed Dec. 8, 1978, Ser. No. 967,687
Int. Cl.³ A61B *19/00*
U.S. Cl. 211—117 **10 Claims**

1. A supporting apparatus for bottles and the like comprising an upper elongate rod member, a lower elongate tubular rod member receiving said upper member and movable longitudinally therealong, a first lock member mounted on the upper portion of said lower rod member and movable into locking engagement with said upper rod member to lock said members together and thereby adjust the overall effective length of said rod members, operating means engaging said first lock member for shifting said first lock member into locking engagement with said upper rod member, a body structure slidable along said lower member and adapted to support one or more bottles,

a second lock member carried by said body structure and engaging said lower member to releasably secure said body structure to said lower member at different locations along said lower member, lock releasing means on said lower member for releasing said first lock member from said upper member including an actuator disposed on and slidable along the exterior of said lower member below said body structure, a release rod in said lower member connected to said actuator and having an

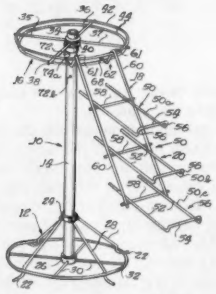


upper portion thereon engageable with said first lock member to shift said first lock member from locking engagement with said upper rod member in response to upward movement of said actuator and release rod along said lower member, and means for moving said actuator and release rod downwardly along said lower member to enable said operating means to reshift said first lock member into locking engagement with said upper rod member.

4,289,245
MERCHANDISE DISPLAY STAND
Joseph Hasulak, 2932 N. 2nd St., Phoenix, Ariz. 85012
Filed Dec. 20, 1978, Ser. No. 971,235
Int. Cl.³ A47F *5/05*
U.S. Cl. 211—133 **11 Claims**

1. A merchandise display stand including, in combination:
an elongated center post member; and
a plurality of display members adapted to be stacked upon one another on said post member, each of said display members formed from a flat blank of material having first, second, and third spaced-apart openings therein in first, second, and third portions thereof, said first portion being the center portion and said second portion being on one side of said center portion and said third portion being on the other side of said center portion, with said first, second, and third openings located on a common line through the centers thereof, the second and third openings being located at equal distances from the first opening, a first pair of spaced-apart parallel score lines on each of said display members between said first and second openings and a second pair of spaced-apart parallel score lines on each of said display members between said first and third openings, the distance between said first and second score lines being the same as the distance between said third and fourth score lines and all of said score lines being parallel to one another, said display member being adapted to be folded on said first and second score lines to cause said first and second portions of said display member to overly one another, and said display member being adapted to be folded on said third and fourth score lines to cause said first and third portions of said display member to overly one another with the first, second, and third openings having a common axis therethrough so that said center post member may be passed through the openings to sustain said display members for displaying articles therein.

4,289,246
FREE STANDING MERCHANDISER
George B. Scott, 1375 Phoenix Dr., Des Plaines, Ill. 60018
Filed May 24, 1979, Ser. No. 42,012
Int. Cl.³ B61G *1/00;* **E04G** *5/06*
U.S. Cl. 211—205 **5 Claims**



1. A freestanding merchandiser of the type consisting of a stand, a column upstanding from the stand, support means carried at the upper end of the column, and a carrier detachably connected to the support means and having framework suited to hold merchandise to be frontally displayed, the improved combination comprising said support means being in the form of two elongated elements spaced apart and offset both vertically and horizontally from one another, where one of the elements is disposed forwardly of the other of the elements, said elements being in the form of rings with the upper ring having a larger diameter than the lower one of the rings, said carrier having a pair of mounting arms upstanding rearwardly from the framework, and a hook configuration formed on the upper end of each arm from an uppermost part of the arm, a first contiguous arm segment angled relative to the upper arm part and defining therebetween a downwardly facing V-Bend superimposed on the upper side of said upper ring, and a second contiguous arm segment to extend rearwardly and radially toward said column and in a direction away from the V-Bend and from the uppermost arm part and disposed under said lower ring; said first contiguous arm segment fitting between the two spaced support rings, and the second contiguous arm segment underlying the lower support ring.

4,289,247
ARRANGEMENT FOR ARRESTING AND RELEASING AN INTERMEDIATE BUFFER COUPLING

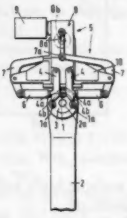
Werner Brand, Leverkusen; Jaroslav Zavadil, and Wolfgang Heuer, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Waggonfabrik Uerdingen AG, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 29, 1979, Ser. No. 89,037

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846860

Int. Cl.³ B61G *9/20*

U.S. Cl. 213—20 **7 Claims**



1. An arrangement for horizontal central arresting and releasing of an intermediate buffer coupling, particularly for rail vehicles, the arrangement comprising in combination a horizontally swingable coupling rod having a central longitudinal plane and a rear end; a guide member provided at said rear end of said coupling rod and following the swinging of the latter; two rocking levers each pivotally mounted on a vehicle and having a first abutment face and a second abutment face; a roller supported on said guide member and located in said central longitudinal plane of said coupling rod and between said rocking levers so as to abut against said first abutment faces of the latter; said guide member being provided with two auxiliary rollers each located at the respective side of said central longitudinal plane and cooperating with a respective one of said second abutment faces; and an actuating device connected to said rocking levers and operative for opening of said rocking levers in the sense of allowing free movement of the intermediate buffer coupling.

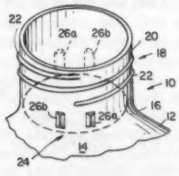
4,289,248
CONTAINER CLOSURE ASSEMBLY HAVING INTERMEDIATE POSITIONING MEANS

Robert W. Lynn, Oxnard, Calif., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Oct. 15, 1979, Ser. No. 84,883

Int. Cl.³ B65D *41/04*

U.S. Cl. 215—330 **4 Claims**



1. In combination, a container having an open neck portion formed with threadable engaging means and a removable closure formed with mating threadable engaging means, said closure including an open end covering said neck portion and a closed end for sealing said container closed; a pair of projections on said neck portion located between the neck portion/container interface and the threadable engaging means, said projections being disconnected from said threadable engaging means and being laterally spaced apart from each other in a plane substantially perpendicular to the longitudinal axis of said container; at least one protuberance on the inside wall of said closure located between the open end thereof and the mating threadable engaging means, said projections being spaced to allow said protuberance to nestle therebetween when the closure is threaded on said neck portion, said projections being shaped to allow said protuberance to pass thereover in either direction when said closure is threaded on or off of said neck portion, said protuberance requiring an applied force to enable same to pass over each projection so that said closure can be partially unthreaded from said neck portion but yet remain connected thereto.

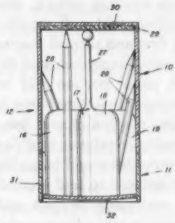
4,289,249
CONTAINER

Herman S. Cripe, 2030 Hillsdale, Kalamazoo, Mich. 49007

Continuation of Ser. No. 395,289, Sep. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 175,479, Aug. 27, 1971, abandoned. This application Jan. 23, 1976, Ser. No. 651,932

Int. Cl.² B65D *85/00, 43/00*

U.S. Cl. 220—22 **2 Claims**



1. An upright cylindrical container for pencils which comprises a base portion having a bottom and an outside wall defining one half of a hollow cylinder and a cover portion having a top and an outside wall defining the other half of the hollow cylinder, said base and cover portion having the same inside diameter;

a plurality of radially extending partitions mounted within the base portion, dividing the base portion into a plurality of compartments adapted to receive therein one end of a plurality of pencils, said compartments being so proportioned to the pencils that the other ends thereof project above the outside wall of the base portion, at least three of said partitions projecting above the outside wall of the base portion and extending outwardly all the way to the inner circumference of said cylinder so that the outer edges thereof frictionally engage said cover portion at at least three separate points about the inner circumference thereof;

the depth of the several compartments of the base portion being determined by the height of the outside wall and said depth being selected to allow the pencils to flare outwardly while at the same time retaining the pencils within the compartment;

the height of the outside wall of the base portion relative to the radius of the base portion being such as to limit outward flaring of pencils in said container to about 45 degrees from the vertical for ready selection by the user;

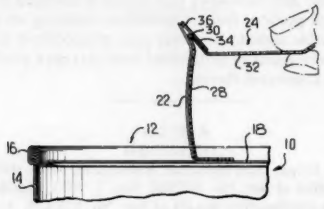
the height of said cylinder being sufficient to retain pencils in an upright position within said container when said container is closed, and the height of the outside wall of said cover portion being substantially greater than the height of the outside wall of the base portion, and wherein the bottom of the hollow base portion is concave so that the compartments are deeper near the center than they are near the outside wall.

4,289,250

EASY OPENING CONTAINER WITH TAB HAVING SEPARATE OPENING ELEMENT

Thomas F. Jordan, Oak Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 28, 1980, Ser. No. 144,006
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—269 **7 Claims**



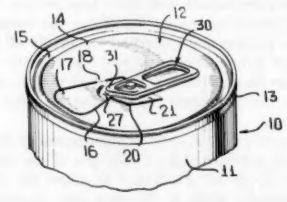
1. An easy opening container component comprising a panel, a line of weakness in said panel defining a displaceable panel portion, and an opening device, said opening device including a pull member, said pull member being reversely folded and including first and second portions integrally connected along a transverse hinge line, said first portion overlying said displaceable panel portion and being permanently secured thereto with said hinge line being in spaced adjacent relation to an adjoining portion of said line of weakness, said second portion generally overlying said first portion and including a grip part remote from said hinge line, and an opening element permanently secured to said second portion adjacent said hinge line and projecting beyond said hinge line, said opening element terminating in a force applying end generally aligned with said line of weakness adjoining portion.

4,289,251

NON-DETACH EASY OPENING CONTAINER UNIT

Leonard A. Maliszewski, Western Springs, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed May 9, 1980, Ser. No. 148,468
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—269 **19 Claims**



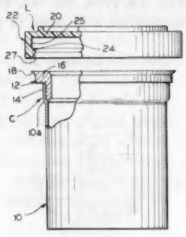
1. An easy opening container unit comprising a container panel, a first line of weakness in said container panel defining a first displaceable panel portion for forming a dispensing opening, a second line of weakness in said container panel adjacent said first line of weakness defining a second displaceable panel portion permanently joined to said container panel along a second hinge line for forming a hinge panel, and an opening tab fixedly secured to said second displaceable panel portion for hinging therewith relative to said container panel and having means for applying a displacing pressure on said first displaceable panel portion.

4,289,252

HERMETICALLY SEALED CONTAINER

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jul. 21, 1980, Ser. No. 170,827
Int. Cl.³ B65D *39/00*
U.S. Cl. 220—308 **8 Claims**



1. In a hermetically sealable body and lid arrangement for a container, the combination of:

(a) a lid formed of relatively soft, flexible, molded plastic material and including:

(i) a top wall;

(ii) an annular rim depending from said top wall;

(iii) an annular flange extending radially inward from a lower portion of said rim and defining therewith and with said top wall an annular recess;

(b) a tubular container body open at the top;

(c) a container rim formed of relatively hard, non-flexible, plastic material and including:

(i) an annular skirt secured within an upper marginal portion of said body;

(ii) an annular flange extending radially outward from an upper portion of said rim for receipt with the recess of said lid;

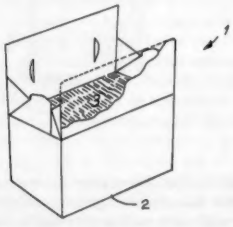
(iii) an annular sealing bead projecting radially outward from said flange and presenting a pointed sharp peripheral edge adapted to dig into the rim of said lid to effect a seal between said lid and container.

4,289,253

METHOD FOR WARMING AND DAMPING OF NON-WOVEN, DISPOSABLE, STRENGTH TREATED NAPKINS OR TOWELS

Karl G. B. Andersson, Halmstad, Sweden, assignor to Duni Bila AB, Sweden

Continuation of Ser. No. 672,649, Apr. 1, 1976, abandoned. This application Oct. 4, 1977, Ser. No. 839,312
Claims priority, application Sweden, Apr. 10, 1975, 7504128
Int. Cl.³ A47K *10/24*
U.S. Cl. 221—1 **1 Claim**



1. A method for warming and dampening of non-woven, disposable wet strength napkins or towels comprising:

providing a trough-shaped box having a waterproof coating

therein and having water-tight corner sections and an open end;

placing a plurality of non-woven disposable wet strength treated napkins upright in said box in side by side relationship with one end of each of said napkins facing said open end of said trough-shaped box;

heating a predetermined quantity of water to approximately its boiling point;

pouring said predetermined quantity of heated water through said open end into said trough-shaped box over said plurality of napkins to collectively and completely warm and dampen said plurality of napkins in said trough-shaped box, said predetermined quantity of water being large enough so that each of said napkins is entirely dampened but small enough so that the napkins do not drip upon dispensing; and

dispensing said dampened and warmed napkins directly from said trough-shaped box.

4,289,254

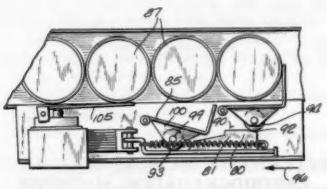
ARTICLE DISPENSER WITH CAM ACTUATED GATE

Carl E. Spring, La Crosse, Wis., assignor to La Crosse Cooler Company, La Crosse, Wis.

Filed Nov. 26, 1979, Ser. No. 97,270

Int. Cl.³ G07F *11/34*

U.S. Cl. 221—295 **5 Claims**



1. In a coin operated vending machine having a frame, a magazine supported on said frame with a sloping guide surface for supporting and delivering by gravity the leading container from a row of containers, the improvement comprising a leading container gate, means for supporting said leading container gate on said frame for movement between an advanced leading container blocking position and movement to a retracted leading container release position, a row gate, means for supporting said row gate on said frame for movement between a row blocking position and a row advance position, means for operating said leading container gate and row gate to separate and release the leading container from the row and hold back the row of containers during separation, said means including a slide having first, second and third gate position controlling surfaces, said second surface being inclined and transverse with respect to said first surface and the direction of reciprocating movement of the slide and said third surface being offset from the axis of reciprocation, said first surface being at a steeper angle than said second surface to provide a fast rise time for the row gate to catch a can prior to movement thereof and wherein said third surface has a portion inclined forwardly in the direction of the path of movement of the container to urge said slide to the retracted position and toward the longitudinal axis of the slide, and means for supporting the slide on said frame for reciprocating movement between an extended and retracted position, and motor means for reciprocating said slide in a standby and vend cycle whereby said leading container gate is supported on said third surface during standby and said row gate is supported on said first surface and, upon energization of the motor means, said row gate will move into a row blocking position upon lateral movement of said slide toward said row gate as said inclined surface coacts with said gate and then said leading container gate dropping from said third surface portion by gravity and the weight of the container when the slide reaches the vend position to remove the gate from the path of the first container and upon release of the container the slide returning to the standby position.

4,289,255

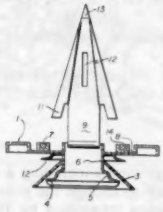
OIL FILTER CAP

Clarence W. Strampe, 901 S. Ruth #49, Sioux Falls, S. Dak. 57106

Filed Oct. 18, 1979, Ser. No. 86,251

Int. Cl.³ B67B *7/26*; F01M *11/04*

U.S. Cl. 222—81 **5 Claims**



1. An oil filler cap comprising in combination:

a tube with latching means on a lower portion thereof for attachment to an oil inlet on a car,

a hardened tip on a top portion of said tube used to puncture an oil can,

a flared skirt medial portion tapering towards said tip of said tube between said upper and lower portions provided with openings therethrough, whereby when an oil can is punctured on said tip and forced on said flared skirt medial portion, the puncture is enlarged and oil passes through said openings down said tube and into the oil inlet of the car, an overlying protective cap extending over said tip and tapering medial portion whereby when not in use said tip is not exposed and oil vapors are contained within said cap, said latching means comprises an outwardly flared terminus on the lowermost portion of said tube, at least two tab members extending outwardly from said terminus, and a pinch plate above said terminus extending outwardly from said tube whereby said terminus is placed below the oil inlet and said pinch plate thereabove, said tab members oriented to pass through the inlet and when rotated will force and secure said pinch plate down and around said inlet, and said pinch plate comprises an annular flange extending outwardly from said tube having diametrically opposed ears along an outer periphery thereof, an outer lip integral with said ears, a recessed annular top groove within said outer lip, a concentric annular upstanding channel member within said groove and a circular recess within said channel member.

4,289,256

TRAMLINING DEVICE FOR SEED DRILL

Alfred J. Bailey, Coventry, United Kingdom, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Oct. 1, 1979, Ser. No. 80,899

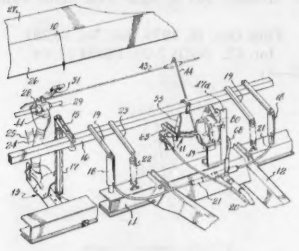
Claims priority, application United Kingdom, Oct. 7, 1978, 39713/78

Int. Cl.³ A01C *7/18*

U.S. Cl. 222—52 **13 Claims**

1. A tramlining device for use with a seed drill having a hopper and a series of coulters mounted on a frame with means for raising and lowering said coulters, comprising, bout registering means for registering a number of successive bouts, indexing means responsive to raising of the coulters at the end of successive bouts and operative to index said bout registering means between successive registered bout numbers, individual inhibiting means each adapted to be changed between an inop-

erative state in which the discharge of seed or other granular material is permitted from a respective drill spout and an operative state in which such discharge is inhibited, and linkage means which responds to selected bout numbers registered by said bout registering means to change the state of said inhibiting means, the linkage means including a separate fluid pressure operated actuator to change the state of each inhibiting means and valve means controlled by the bout registering means for supplying pressurized fluid to said actuator at selected registered bout numbers.



4,289,257

DEVICE FOR MELTING A SOLID BODY OF ADHESIVE MATERIAL

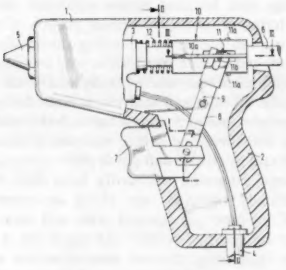
Armin Herb, Peissenberg; Franz Popp, and Hanspeter Ruoff, both of Munich, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Oct. 9, 1979, Ser. No. 82,724

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2844931

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—146 HE **8 Claims**



1. Device for melting a body of thermoplastic adhesive material and for effecting a dosed discharge of the molten material comprising a housing having a first end from which the molten material is discharged and a second end through which a solid body of the adhesive material is introduced into the housing, a melting chamber within said housing for supplying molten material for discharge from the first end of said housing, a feed apparatus within said housing between said melting chamber and the second end of said housing for stepwise feeding the solid body of adhesive material into the melting chamber, said feed apparatus including a carriage slidably mounted in said housing for movement in the direction between the first and second ends of said housing, a clamping device located within said housing and displaceable between a release position out of engagement with the solid body of the adhesive material and a holding position in clamping engagement with the solid body of adhesive material, a rocker lever pivotally mounted in said housing and disposed in engagement with said feed apparatus for displacing said clamping device into the holding position and for moving said feed apparatus, and means on said housing for pivoting said rocker lever, the improvement comprising that said clamping device includes a pair of symmetrical oppositely disposed clamping jaws, each said clamping jaw being articulated to said carriage, and an actuating arm attached to each said clamping jaw and in engagement with said rocker lever so that when said means pivot said rocker lever said clamping jaws are displaced into the holding position in clamping engagement with the body of adhesive material and said feed apparatus is displaced toward the first end of said housing, each said clamping jaw includes said actuating arm formed integrally with said clamping jaw and formed therefrom in a tab-like manner extending laterally outwardly away from the other said clamping jaw, and said arm being articulated to said rocker lever, each said clamping jaw includes a sharp-edged projection extending laterally inwardly from said clamping jaw toward the other said clamping jaw for engaging into the surface of the solid body for assuring gripping contact with the solid body when it is moved toward said melting chamber, said feeding apparatus includes a longitudinal guide secured to and extending outwardly from each of the opposite sides of said carriage, said housing having grooves therein into which said longitudinal guides project for guiding said feeding apparatus in the movement thereof between the first and second ends of said housing.

4,289,258

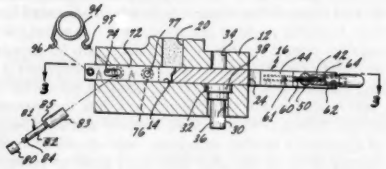
SAFETY CHARGE MEASURING DEVICE FOR CARTRIDGE LOADING MACHINES

Charles R. Ransom, C'Arco P.O. Box 308, Highland, Calif. 92346

Filed Dec. 17, 1979, Ser. No. 104,137

Int. Cl.³ F42B *33/02*; G01F *11/18*

U.S. Cl. 222—308 **5 Claims**



1. In apparatus for measuring and dispensing flowable material; in combination, a member having a channel formed in it, a sliding member constructed to slide in the channel, there being a receiving opening for dispensed material, the first member having a passageway for conducting material to the receiving opening, mechanism for adjusting the size of the receiving opening, the sliding member having a slot having an end in it, the mechanism including a secondary slide member having an end positioned in the slot whereby the receiving opening is formed between the end of the slot and the end of the secondary slide member, means holding the secondary slide member whereby its position can be adjusted to adjust the size of the said receiving opening and means for locking the adjusted position of the secondary slide member, said holding means being constructed so as to require movement of the secondary slide member out of the slot for adjustment, and means for dispensing from the receiving opening, the secondary member having pivotal mounting in the slot whereby it can be swung laterally out of the slot.

4,289,259

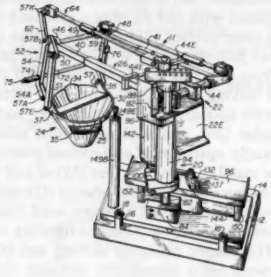
AUTOMATIC LADLER

John W. O'Brien, 607 S. Kelly St., Harrison, Ark. 72601

Filed Nov. 23, 1979, Ser. No. 97,433

Int. Cl.³ B22D *41/04, 41/06*

U.S. Cl. 222—590 **23 Claims**



1. An automatic ladler device comprising:

a supportive base adapted to be disposed upon a supporting plane;

ladle means for containing molten metal;

platform means for radially moving said ladle means between metal filling and metal discharge position;

elongated ladle support arms means pivotally coupled to said platform means for controllably suspending said ladle means from said platform means;

linkage means for pivotally coupling said ladle means to said ladle support arm means;

rigid, rotatable stanchion means extending vertically upwardly from said base for operatively mounting said platform means above said base;

means for raising and lowering said ladle support arm means whereby to raise and lower said ladle means;

means for rotating said stanchion means whereby to move said platform means and said ladle means radially between metal filling and metal discharge positions; and

means for discharging molten metal from said ladle means.

4,289,260

ROOF CARRIER FOR MOTOR VEHICLES

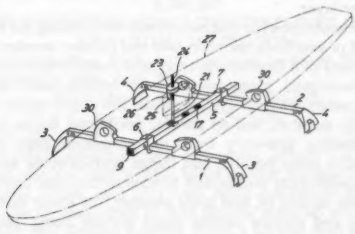
Reinhold Zoor, Dachau, Fed. Rep. of Germany, assignor to Heinrich Wunder KG, Dachau, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 68,020

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1978, 2836311

Int. Cl.³ B60R *9/08*

U.S. Cl. 224—315 **14 Claims**



1. A roof carrier for use on motor vehicles, comprising a supporting structure mounted at the roof of a motor vehicle when in use and including a plurality of interconnected elements including a longitudinally extending element and at least one transversely extending element; at least one holder assemblable with said supporting structure; and means for securing said holder to said supporting structure when assembled therewith, including a sliding member mounted on one of said elements for displacement between a withdrawn and an engaging position and so acting on said holder as to hold the latter in engagement with said one element only in said engaging position, and means for locking said sliding member at least in said engaging position.

4,289,261

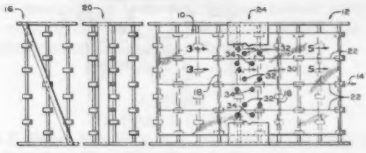
METHOD OF THERMALLY INDUCING BENDING MOMENT FORCES TO SEVER A GLASS SHEET ALONG A SCORE

J. Robert Dahlberg, Jeannette, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 6, 1980, Ser. No. 127,692

Int. Cl.³ B26F *3/06*; C03B *33/09*

U.S. Cl. 225—2 **5 Claims**



1. A method of severing a sheet of refractory material having a thickness of less than about 0.120 inches (0.305 centimeters) comprising the steps of:

contacting a surface of the sheet with scoring means to define a contacted sheet surface and to impose a score in the sheet having a depth of at least about 80% of the sheet thickness; and

heating portions of the contacted sheet surface on each side of the score to a temperature greater than the temperature of the opposite sheet surface to thermally induce bending moment forces about the score to sever the sheet along the score.

4,289,262

STRUCTURE OF DISPENSER FOR DISPENSING WEB-LIKE MATERIAL

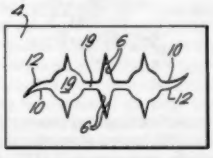
Oscar P. Finkelstein, 14/18 Ein Rogel St., Jerusalem, Israel

Filed Aug. 13, 1979, Ser. No. 66,064

Claims priority, application Switzerland, Aug. 23, 1978, 8917/78

Int. Cl.³ B26F *3/02*

U.S. Cl. 225—106 **14 Claims**



1. In a dispenser apparatus for tearable web-like material, the improvement comprising:

an aperture in a wall of the dispenser, said aperture having a plurality of zones wide enough for at least two fingers simultaneously to reach through said zones and into the dispenser to grasp the material and a plurality of slots, the edges of each of said slots converging in a sharp angle at an apex; and

the material being a continuous, hollow, cylindrical roll drawable through said zones and toward said apex; whereby individual pieces of said material of a desirable

length may be detached from said roll of material when pulled toward said apex.

4,289,263

APPARATUS FOR FEEDING A STRIP OF CONTINUOUS FORMS

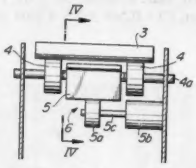
Takamasa Namba; Hidekata Yanagawa, both of Tokyo; Nobuo Fujimoto, Seto; Takehiko Mori, and Takayoshi Yamada, both of Owariasahi, all of Japan, assignors to Hitachi, Ltd. and Japan Air Lines Company Limited, both of Tokyo, Japan

Filed Oct. 12, 1979, Ser. No. 84,454

Claims priority, application Japan, Oct. 25, 1978, 53/130525

Int. Cl.³ B65H *23/04*; G03B *1/48*

U.S. Cl. 226—196 **5 Claims**



1. An apparatus for feeding a strip of continuous forms including forms arranged in at least two layers and having a plurality of series of perforations extending widthwise of the strip and arranged at regular intervals lengthwise of the strip, comprising:

a. a guide formed with a bend for forming a bent portion in said strip in a position corresponding to one of said plurality of series of perforations;

b. a member located inwardly of the bent portion of said strip; and

c. drive means for moving at least one of said guide and said member relative to the other to bring the bent portion of the strip into contact with the member.

4,289,264

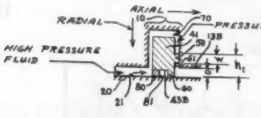
UNIFORM LOAD PISTON RING

James J. Rawlins, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1979, Ser. No. 23,416

Int. Cl.³ F16K *41/00*

U.S. Cl. 277—27 **1 Claim**



1. A uniform circumferential load piston ring (**40**), in combination with a piston (**10**) having a peripheral groove (**11**) with a downstream radially-extending wall (**12B**) forming one surface upon which said piston ring (**40**) will contact in a sealing manner; a cylinder (**20**) coaxially oriented with and surrounding said piston (**10**), with said cylinder (**20**) having an axially-extending peripheral surface (**21**) forming another surface upon which said piston ring (**40**) will contact in a sealing manner, wherein said piston (**10**) and said cylinder (**20**) are movable relative to each other; and, a fluid under high pressure in an annular passage (G) flowing to said groove (**11**) which is in communication with said passage (G); and, wherein said piston ring (**40**) comprises a ring body (**41**) having:

a. a first protrusion (**50**) annular-shaped and extending axially from said ring body (**40**) in a downstream direction and forming an area of sealing contact with said downstream radially-extending wall (**12B**) of said piston (**10**), with said protrusion (**50**) forming a pressure relief cut, and with said protrusion (**50**) having an axially-extending surface (**51**) which is located such as to be prevented from entering said annular passage (G);

b. a second protrusion (**60**) unsegmented, annular-shaped, and extending radially from said ring body (**41**), with said second protrusion (**60**) having an axially-extending surface (**61**) in contact with and forming a seal with said axially-extending inner surface (**21**) of said cylinder (**20**);

c. and, a third protrusion (**80**) annular shaped and extending radially from said ring body (**41**), with said third protrusion (**80**) having an axially-extending surface (**81**) in contact with said axially-extending inner surface (**21**) of said cylinder (**20**), and with said third protrusion (**80**) located axially upstream of said second protrusion (**60**);

whereby the inability of said surface (**51**) of said first protrusion (**50**) to enter said annular passage (G) assures an area of constant sealing contact between waid first protrusion (**50**) and said downstream radially-extending wall (**12B**) of groove (**11**), despite eccentric shifting and lateral movement between each piston (**10**) and said cylinder (**20**), thereby said load caused by said fluid under high pressure is uniformly and circumferentially distributed and exerted on said ring body (**41**).

4,289,265

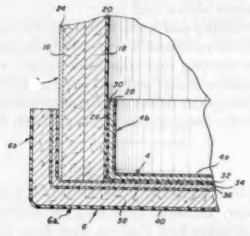
COMPOSITE END CONSTRUCTION FOR COMPOSITE CONTAINERS, SUCH AS OIL CANS

Donald H. Ellerbrock, Florissant, Mo., assignor to Boise Cascade Corporation, Boise, Id.

Filed Dec. 28, 1979, Ser. No. 107,891

Int. Cl.³ B65D *3/10*

U.S. Cl. 229—5.5 **12 Claims**



1. An improved composite container for liquids, such as oil, comprising

(a) a tubular vertically-arranged composite body member including at least one fibrous body wall layer, and an inner liner layer;

(b) a membrane-type end closure member closing the bottom end of said body member, said end closure member being formed of a flexible relatively thin material and including a horizontal planar disk-shaped central panel portion extending transversely across the lower extremity of said body member, and an annular peripheral flange portion extending upwardly from the peripheral edge of said central panel portion, said flange portion being arranged concentrically within, and bonded to the inner circumferential surface of, said body member, the lower surface of said end closure central panel portion being generally coplanar with the lower extremity of said tubular body member; and

(c) an outer support cap mounted in protective supporting relation below said closure member, said support cap having at least one fibrous layer and including a horizontal planar disk-shaped central panel portion in contiguous engagement with the lower extremity of said tubular body

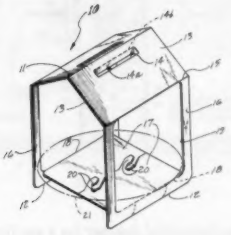
member, and an annular peripheral flange portion extending upwardly concentrically about, and bonded to the external surface of, the lower end of said body member, the central panel portion of said outer support cap extending in contiguous supporting relation below the central panel portion of said membrane-type end closure member.

4,289,266

ARTICLE CARRIER

Raymond V. Maroszek, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Dec. 19, 1979, Ser. No. 105,115
Int. Cl.³ B65D *5/02*
U.S. Cl. 229—28 BC **6 Claims**



1. A carrier for one or more stackable articles, formed from a blank of flexible and resilient material of generally rectangular configuration wherein a first score line is provided intermediate the short ends of said blank about which said blank is folded so that regions of said blank adjacent said first score line are divergent at an angle, said blank having a pair of apertures in said divergent regions of said blank, said apertures being uniformly spaced from said first score line, said blank further having a pair of openings in confronting side wall portions thereof intersecting said divergent regions along provided parallel score lines, and panel portions on said side wall portions cut thereform to form at least portions of said openings and folded toward one another about second score lines that are distal from said first score line, are spaced from said short ends, and are parallel to one another, so that said panel portions are substantially coplanar, are spaced from said short ends, and extend perpendicular to the plane of said parallel side wall portions, and means fastening said panel portions to one another in provision of an article carrier, wherein articles may be carried singly or stacked upon one another and supported on said fastened panel portions, while projecting through, and retained by portions of said wall portions defining, said openings.

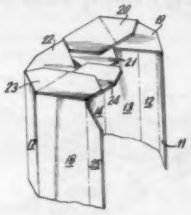
4,289,267

EIGHT-SIDED PREFABRICATED CONTAINER HAVING AN AUTOMATIC BOTTOM

Larry Mayea, New York, N.Y., assignor to Arkay Packaging Corporation, New York, N.Y.

Filed May 1, 1980, Ser. No. 145,630
Int. Cl.³ B65D *5/10, 5/36*
U.S. Cl. 229—39 R **9 Claims**

1. An eight-sided container comprising at least one sheet of flexible material, said flexible being divided by fold lines into eight-side panels, said fold lines being positioned such that when the terminal ends of said flexible material are secured together, said flexible material forms a tubular wall structure having eight sides; a collapsible end structure, comprising a plurality of six flaps hingedly extending from one end of a plurality of the side panels at an angular relationship thereto, a first and second pair of said flaps extending from a first and second pair of side panels which are oppositely deposed from each other when said container is in an erected position, the first flap of said first and second pairs of flaps being fixably attached to the second flap of said first and second pair of flaps, said flaps being adapted to interlock with each other to form a bottom portion of said eight-sided container when said container is opened to an erected position without the need for any additional manipulative steps, wherein said bottom portion is capable of being collapsed to a flat position within said container when said container is in a storage position.

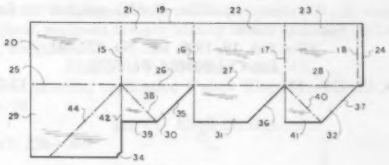


4,289,268

FOLDABLE CARTON

Richard E. Paige, New York, N.Y., assignor to The Paige Company Containers, Inc., New York, N.Y.

Filed Feb. 8, 1980, Ser. No. 119,617
Int. Cl.³ B65D *5/08, 5/36*
U.S. Cl. 229—41 B **9 Claims**



1. A foldable carton comprising side walls and end walls hingedly connected together along their side edges, a bottom panel hingedly connected to the lower edge of each wall, the bottom panels of two adjacent side and end walls being hingedly connected together and the bottom panels of the other two adjacent side and end walls being hingedly connected together, the bottom panels being folded between the side and end walls when the carton is in its collapsed condition and the bottom panels swinging downwardly to a position perpendicular to the side and end walls when the carton is erected, one of the bottom panels being larger than the others, the larger bottom panel overlying and being supported by all the other bottom panels when the carton is in its erected condition, the larger bottom panel having a hinge line along which it can bend in a direction away from the bottom panel to which it is hinged during movement of the large bottom panel when the carton is folded and unfolded between its collapsed and erect conditions, the hinge line extending at an acute angle to the hinge between the larger bottom panel and its respective carton wall, and the larger bottom panel being in flat unfolded condition when the carton is in its collapsed condition.

4,289,269

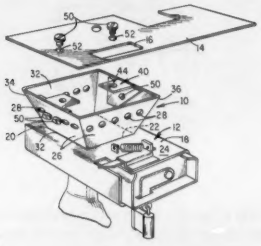
UNIVERSAL FUNNEL AND MOUNTING BRACKET FOR COIN RECEPTACLES OF COIN OPERATED MACHINES

August M. Sciortino, 1838 Weeg Way, Park Ridge, Ill. 60068

Continuation-in-part of Ser. No. 13,370, Feb. 23, 1979, abandoned. This application May 23, 1979, Ser. No. 41,755
Int. Cl.³ G07B *15/00*
U.S. Cl. 232—16 **6 Claims**

1. A funnel for installation upon a mounting plate of a coin

operated machine comprising, a frame member having at least four substantially identical panels of frustoconical perimetric configuration, said panels being secured end to end to define an entrance and a smaller opening opposite thereto, at least a pair of opposite panels each carrying at least one aperture spaced



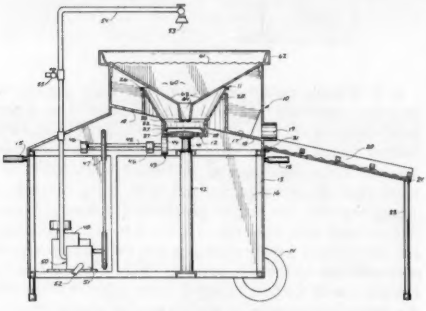
inwardly of the entrance, apertured clip means and fastening means for securing said clip means to each of said opposite panels via said apertures, said clip means including a base oriented for positioning flush with said entrance with an angled leg secured to said panels flush to the surface thereof whereby to locate said entrance in condition to receive coins.

4,289,270

PORTABLE CONCENTRATOR

Arthur E. Warsinske, Spokane, Wash., assignor to Jack G. Riley, Spokane, Wash.

Filed Feb. 19, 1980, Ser. No. 122,031
Int. Cl.³ B04B *1/04, 7/12*
U.S. Cl. 233—27 **12 Claims**



8. A concentrator for heavy particulates, comprising:

a frame;

a bowl on the frame having an open upper end defined by a continuous peripheral wall and a closed bottom end defined by a horizontal bottom wall;

bearing means releasably mounting the bowl to the frame for free rotational movement about an upright center axis;

drive means releasably engaging the bowl for rotating the bowl about the center axis;

a pan releasably received within the bowl and having a continuous peripheral upright wall complementary to the bowl wall adjacent the closed bottom thereof, said upright wall extending axially from an open top edge to a horizontal bottom wall spanning the pan at a bottom end thereof; and

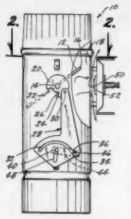
flange means within the pan forming an annular pocket within the pan adjacent the juncture of the peripheral wall of the pan and its bottom wall.

4,289,271

DAMPER CONSTRUCTION FOR A GAS FIRED COMBUSTION APPARATUS

James T. Barth, Wisconsin Rapids, Wis., assignor to Barth, Inc., Wisconsin Rapids, Wis.

Continuation-in-part of Ser. No. 922,780, Jul. 7, 1978, Pat. No. 4,225,080. This application Jul. 9, 1979, Ser. No. 56,029
Int. Cl.³ G05D *23/00;* **F23N** *3/00*
U.S. Cl. 236—1 G **3 Claims**



1. A thermally controlled damper for a gas fired combustion apparatus comprising,

a stack connected to the combustion apparatus and adapted to conduct waste gases of combustion,

a damper pivotally mounted within the stack and being movable from a closed position to an open position,

a thermally responsive element disposed in the stack upstream of the damper,

a linkage means operatively connecting said thermally responsive element and said damper whereby a predetermined increase in temperature in the stack will actuate said thermally responsive element to cause said linkage means to move said damper from the closed position to the open position,

said stack having an opening formed therein upstream of said damper,

a temperature responsive safety mechanism positioned outwardly of said stack opening and being spaced therefrom whereby ambient air will pass around said temperature responsive safety mechanism and into said stack opening when sufficient draft exists in said stack and whereby heated gases of combustion will pass outwardly through said stack opening towards said temperature responsive safety mechanism when insufficient draft exists in said stack,

said temperature responsive safety mechanism being responsive to a predetermined elevated temperture and being operably connected to said combustion apparatus whereby said temperature responsive safety mechanism will cause the operation of the combustion apparatus to be terminated when the temperature of the said safety mechanism senses a predetermined temperature level,

said stack being substantially vertically disposed and is cylindrical in shape and wherein said damper is elliptical in shape,

said damper being disposed at an acute angle with respect to the axis of the stack when in its closed position and being generally parallel to the axis of the stack when in its open position,

said damper having a portion of its upper peripheral edge thereof spaced from the inner wall of the stack when the damper is in its closed position to provide a vent opening therebetween,

said stack opening being positioned upstream of and generally immediately below said vent opening.

4,289,272
TEMPERATURE CONTROL APPARATUS

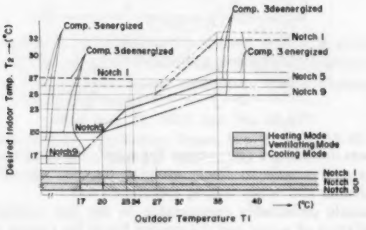
Fujio Murase; Hidenosuke Matsumoto, both of Kusatsu; Hiroshi Fujieda, Kashihara; Teruhisa Takano, Osaka, and Kenichiro Imasu, Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 23, 1979, Ser. No. 23,237

Claims priority, application Japan, Mar. 31, 1978, 53/38373; Apr. 3, 1978, 53/39402; Apr. 3, 1978, 53/39403; Apr. 3, 1978, 53/39404

Int. Cl.³ G05D *23/00*; F25B *29/00*

U.S. Cl. 236—91 D **10 Claims**



1. A temperature control apparatus which comprises, in combination, an outdoor temperature detector for detecting the outdoor temperature of the outside of a space to be air-conditioned, an indoor temperature detector for detecting the indoor temperature in the space to be air-conditioned, a storage device for storing a plurality of desired indoor temperatures each of which is expressed by a linear function of the outdoor temperature and for storing a plurality of desired indoor temperatures each comprised of a fixed value, a comparing means operatively connected to and responsive to said indoor and outdoor temperature detectors and said storage device for comparing the detected indoor temperature with a selected one of said desired indoor temperatures, and a control device operatively connected to and responsive to said comparing means for controlling the operation of an air-conditioning apparatus;

wherein said storage device stores the linear function of $(y=ax+b)$, wherein a represents a coefficient and b represents a constant and x represents the outdoor temperature and y represents the desired indoor temperature, said coefficient and constant being varied by manipulating an indoor temperature adjustment to any one of a plurality of adjustment notches;

and wherein means are provided for switching between any one of said plurality of desired indoor temperatures comprised of a fixed value, corresponding to the indoor temperature adjustment notches, and any one of said plurality of desired indoor temperature expressed by the linear function and corresponding to the indoor temperature adjustment notches.

4,289,273
PLATE AND METHOD FOR LAYING RAILWAY LEVEL CROSSINGS

Fritz Schmidt, Johann-Strauss-Str. 18, Waldkraiburg, Fed. Rep. of Germany (D-8264)

Filed Jun. 20, 1978, Ser. No. 917,348

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1977, 2727644

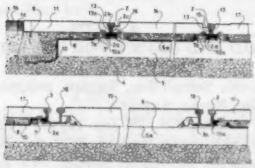
Int. Cl.³ E01C *9/04*

U.S. Cl. 238—8 **25 Claims**

1. A plate for laying as a road surface between the rails of a railway track crossing, the plate comprising resilient rubber material delimited by at least three side and end edges, the length and relative orientation of said side and end edges defining a section of said road surface;

said edges including at least one side edge shaped for interlocking relation with a complementary shaped side edge of an adjacent plate, and end edges shaped for interlocking relation with a respective inwardly facing side of one of said rails;

said plate being resiliently deformable for insertion into said section of road surface and being self-returning to a non-deformed condition in which said interlocking relation of said edges is obtained so that said plate is held in a desired



position with respect to the rails, the interlocking of the at least one side edge with the side edge of an adjacent plate and the interlocking of the end edges with the rails being the only means to restrict vertical movement of said plate, outer side edges of plates forming outer edges of the road surface being contacted by blocking means for restricting movement of the road surface in the longitudinal direction of the rails.

4,289,274
RAIL TRACK

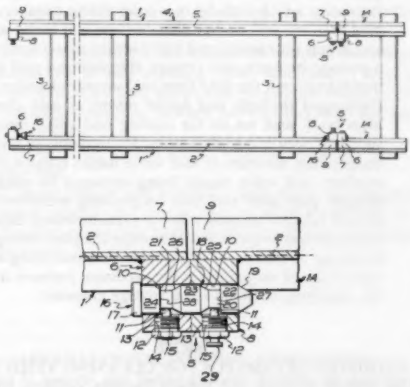
Richard C. Hudson, and Andrew W. Howarth, both of Barnsley, England, assignors to Gyro Mining Transport Limited, Barnsley, England

Filed Feb. 1, 1979, Ser. No. 8,706

Claims priority, application United Kingdom, Sep. 6, 1978, 35736/78

Int. Cl.³ E01B *11/38*

U.S. Cl. 238—249 **13 Claims**



1. A rail length to form part of a rail track comprising: a fastening element secured at each rail end to be joined, said element being provided with a through bore extending parallel to the longitudinal axis of said associated rail length, one said element providing a male fastening element at one end of said rail length, said male fastening element housing in part a connecting pin having an enlarged head at one end and a pair of axially spaced necks along the length thereof, and the other of said elements providing a female fastening element at the other end of said rail length, said female fastening element including a through bore being adapted to receive a portion of the connecting pin of the male fastening element of an adjacent, simi-

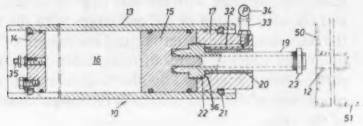
lar rail length, and a resiliently mounted projection carried by each said fastening element located in position to intersect each respective bore and to be engaged with an associated neck on said connecting pin, carried by said female fastening element said projection including head means engageable to provide for selective withdrawal of said projection from the bore, thereby radially displacing said projection to a location in which it lies clear of said bore for disengagement from a mating rail length.

4,289,275

METHOD AND DEVICE FOR BREAKING A HARD COMPACT MATERIAL

Erik V. Lavon, Saltsjö-Boo, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Division of Ser. No. 805,520, Jun. 10, 1977, Pat. No. 4,195,885. This application Nov. 13, 1979, Ser. No. 93,910
Claims priority, application Sweden, Jun. 28, 1976, 7607337
Int. Cl.³ B05B *1/08*
U.S. Cl. 239—101 **22 Claims**



1. A cannon for shooting an elongated fluid mass body of a relatively incompressible fluid comprising:
- a storage chamber for storing the fluid,
- means operatively associated with said storage chamber for substantially continuously exerting a thrust load upon the fluid in said storage chamber,
- means for successive supply of said fluid to said storage chamber against the effect of said thrust load,
- a barrel means coupled to said storage chamber for forming fluid received from said storage chamber into an elongated coherent fluid mass body, and
- valve means which includes two cooperating members coupled between said storage chamber and said barrel means, and means for causing said valve means to suddenly open a passage between said storage chamber and said barrel means to permit the fluid from said storage chamber to be discharged through said barrel means as said elongate mass body, said means for causing said valve means to suddenly open comprising means for accelerating said two cooperating members of said valve means relative to one another, said valve means being arranged to open said passage only after said two cooperating members have moved relative to each other a predetermined distance, the maximum pressure in said storage chamber during said discharge of fluid from said storage chamber being of the same order of magnitude as the maximum pressure during the supplying of fluid to said storage chamber.

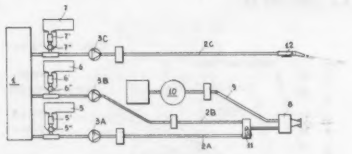
4,289,276

IMPROVED APPARATUS FOR CLEANING VEHICLES

Ezio Bollina, Bologna, and Rubens Basaglia, Galliera, both of Italy, assignors to B & B Bologna di Basaglia Rubens e Bollina Ezio S N C, Bologna, Italy

Filed Oct. 22, 1979, Ser. No. 87,070
Claims priority, application Italy, Nov. 3, 1978, 3583 A/78
Int. Cl.³ B08B *3/08*
U.S. Cl. 239—305 **1 Claim**

1. The vehicle cleaning apparatus comprising:
- three flow lines, each connected to a source of water;
- three containers, a first for an alkaline liquid cleaner, a second for an acid liquid cleaner, and a third for a water-repellent rinsing liquid;
- means connecting each of said containers to a respecive flow line for adding the corresponding liquid to the said line, each of said connecting means including proportionate metering dosage means and a shut-off valve;
- pump means in each of said lines downstream of the point of connection of the corresponding container therewith;
- pressure regulator means in each of said lines downstream of the corresponding pump means;
- a compressed air spray nozzle;
- valve means for selectively alternatively connecting said nozzle to said lines containing a mixture of water and liquid cleaner;



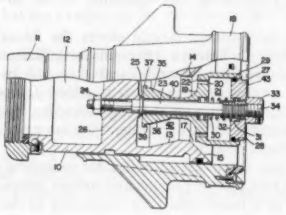
means including a compressor for supplying compressed air to said nozzle to finely atomize the mixture of liquid cleaner and water issuing therefrom; and
- a nozzle detachably connectable to the line containing a mixture of water and the rinsing liquid for rinsing a vehicle subsequent to cleaning by successive applications of the two liquid cleaning mixtures by the spray nozzle and also detachably connectable to said compressed air supply for drying the vehicle subsequent to rinsing.

4,289,277

CONSTANT PRESSURE NOZZLE WITH MODULATION EFFECT

George G. Allenbaugh, Wadsworth, Ohio, assignor to Premier Industrial Corporation, Cleveland, Ohio

Filed Apr. 7, 1980, Ser. No. 137,834
Int. Cl.³ B05B *1/32*
U.S. Cl. 239—452 **10 Claims**



1. In an automatic pressure-regulating mechanism for a flow nozzle, the combination of:
- a nozzle body presenting a discharge orifice,
- a piston rod fixedly secured within said body and extending downstream therein,
- an open-ended baffle cylinder slidably mounted on said piston rod for reciprocable movement thereon relatively to said orifice,
  - said cylinder having a closed end in the path of fluid flow discharge through said nozzle body,
  - said cylinder having an opposite open end downstream of said closed end and out of the path of fluid flow through said body,
- a piston slidably contained in the open end of said cylinder and secured to said rod,
- spring means interposed between said piston and said cylinder to yieldably maintain said baffle cylinder in a predetermined orifice-restricting position,
- said closed end of said cylinder presenting a pressure-responsive first baffle face to the fluid flow, whereby said cylin-

der is displaced in opposition to said spring to enlarge said discharge orifice in response to increased fluid pressure thereon,

an extension provided on said cylinder upstream of said first baffle face and presenting a second baffle face opposed to the direction of fluid flow and movable with said cylinder, and

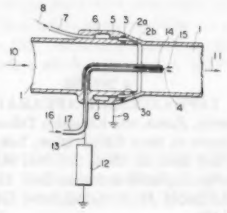
a stem connecting said first baffle face to said second baffle face by a stepped portion to create a low-pressure zone between said faces in response to discharge fluid flow, whereby to modulate any increased displacing force on said first baffle face in response to increased fluid pressure in said nozzle body.

4,289,278

POWDER ELECTRO-CHARGING DEVICE AND ELECTROSTATIC POWDER PAINTING DEVICE

Tsutomu Itoh, Tokyo, Japan, assignor to Onoda Cement Co., Ltd., Yamaguchi, Japan

Filed Aug. 22, 1979, Ser. No. 68,677
Claims priority, application Japan, Sep. 1, 1978, 53-107336
Int. Cl.³ B05B 5/02
U.S. Cl. 239—706 **31 Claims**



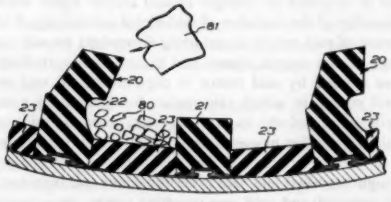
1. A powder charging device characterized in that said device comprises a duct for conveying powder as suspended in gas, an annular electrode chamber positioned outside of said duct and communicating with said duct through a slit extending substantially along the entire inner circumference of said duct, a ring electrode disposed within said electrode chamber and having a substantially large radius of curvature in cross-section, a corona discharge electrode disposed at the center of said duct, means for introducing gas into said duct through said slit, and means for applying a voltage between said respective electrodes.

4,289,279

MILL LINING

Bertil Brandt, Paris, France, assignor to Trelleborg AB, Trelleborg, Sweden

Continuation of Ser. No. 905,510, May 12, 1978, abandoned. This application Nov. 7, 1979, Ser. No. 92,151
Claims priority, application France, May 16, 1977, 77 05693
Int. Cl.³ B02C 17/22
U.S. Cl. 241—102 **10 Claims**



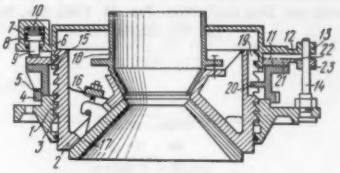
1. A mill lining for a mill drum mounted for rotation about an axis, comprising shell plates and lifter bars made of elastomer material, said lifter bars extending substantially in the axial direction of the mill drum and projecting, as seen from the inner surface of said shell plates, inwardly into the mill drum, said lifter bars having longitudinal incisions in their impact sides facing forwardly in the direction of rotation of the mill drum, said incisions being radially inward of the inner surface of said shell plates and spaced radially outwardly from the inner end of the lifter bars to enable said lifter bars to flex primarily at the location of said incisions when material to be milled impacts said lifter bars.

4,289,280

CRUSHER BOWL CLAMPING DEVICE

Evgeny S. Mitrofanov, ulitsa Kibalchicha, 4, korpus 1, kv. 17; Boris G. Ivanov, ulitsa Basseinaya, 5, kv. 8; Nikolai A. Ivanov, Novoizmailovsky prospekt, 19, kv. 96, all of Leningrad; Gennady A. Kaljunov, ulitsa Festivalnaya, 23, kv. 4, and Isaak Y. Khinich, ulitsa Kosmonavtov, 43-b, kv. 71, both of Sverdlovsk, all of U.S.S.R.

Filed Sep. 13, 1979, Ser. No. 75,336
Int. Cl.³ B02C 2/04
U.S. Cl. 241—207 **2 Claims**



1. A crusher bowl clamping device comprising:

a stationary carrier ring threadably connected with a crushing bowl;

a cylindrical bush mounted on the top end of said carrier ring;

a flange arranged above said cylindrical bush and threadably connected to said crushing bowl, said flange carrying hydraulic jacks with piston rods to provide thrust in the threaded connection between said crushing bowl and said carrier ring;

said flange being locked against rotation about said carrier ring; and

said piston rods of said hydraulic jacks being continuously biased against said carrier ring, so as to thrust load the threaded connection between said flange and said carrier ring with the crushing bowl.

4,289,281

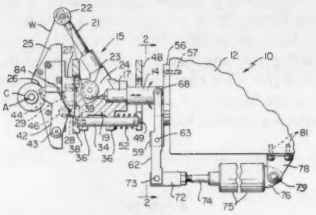
APPARATUS FOR WINDING ARMATURES

Robert D. George, and Robert C. Gray, both of Dayton, Ohio, assignors to Mechaneer, Inc., Dayton, Ohio

Filed Nov. 5, 1979, Ser. No. 90,991
Int. Cl.³ H05K 15/09
U.S. Cl. 242—7.05 B **13 Claims**

1. In apparatus for automatically winding coils of wire on an armature core mounted on a shaft supporting a commutator and for connecting wire leads to the commutator, said apparatus including a rotary shaft, a winding form member positioned adjacent the armature core, a flier assembly supported for rotation with said shaft and relative to said form member, and a movable wire deflector member associated with said form member, the improvement comprising a deflector member actuator carried by said flier assembly for rotation therewith

and movable in an axial direction relative to said shaft, and means for moving said actuator in said axial direction while



said flier assembly is rotating to effect movement of said wire deflector member relative to said form member.

4,289,282

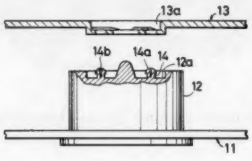
TAPE REEL

Kaname Kohno, Tokyo, Japan, assignor to Dai-Ichi Seiko Co., Ltd., Kawaguchi, Japan

Continuation-in-part of Ser. No. 16,732, Mar. 1, 1979, abandoned. This application Jan. 31, 1980, Ser. No. 117,212

Int. Cl.[3] B65H *75/18*

U.S. Cl. 242—71.8 **4 Claims**



1. A tape reel comprising a lower reel member comprising a disc-like portion and a hub which are designed as an integral part, a disc-like upper reel member, protrusions formed in said hub, and engaging portions which are formed in said upper reel member in such a shape as to be thin on one side and thick on the other side as measured in the direction perpendicular to the surface of said disc-like upper reel member, a notch being formed on the thick side of said engaging portions, whereby said upper and lower reel members can be fixed firmly to each other under attracting force produced by engagement between said protrusions and said engaging portions when said upper reel member is assembled with said lower reel member, and said upper reel member is rotated so as to engage said protrusion with the notch of said engaging portions.

4,289,283

LEG AND SADDLE OF FISHING REEL

Yoshinori Morimoto, Fuchu, Japan, assignor to Ryobi Ltd., Fuchu, Japan

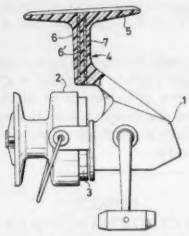
Filed Sep. 12, 1979, Ser. No. 74,621

Claims priority, application Japan, Oct. 16, 1978, 53-142406[U]

Int. Cl.[3] A01K *89/01*

U.S. Cl. 242—84.2 R **11 Claims**

1. In a fishing reel including a main reel body for supporting a spool and a rotor, and a reel mounting member which consists of a saddle portion and a leg portion extending between the saddle and the main reel body, said main reel body and said reel mounting member being integrally formed by synthetic resin, the improvement comprising; a reinforcing member centrally disposed in said leg portion, said reinforcing member



being formed by preimpregnation of fibers which direct along the longitudinal direction thereof.

4,289,284

TAPE CONTROL APPARATUS

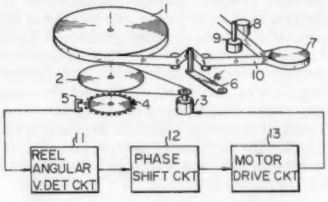
Hitoshi Sakamoto, Zama, and Kazuhiro Takano, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1978, Ser. No. 969,194

Claims priority, application Japan, Dec. 15, 1977, 52-149935

Int. Cl.[3] B65H *59/38;* **G03B** *1/04;* **G11B** *15/32*

U.S. Cl. 242—186 **11 Claims**



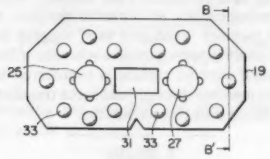
4. Apparatus for controlling the torque applied by a motor to a supply reel so that tape drawn from said supply reel by a tape transport system is transported with a substantially constant tape tension, said apparatus comprising: means for detecting the rotational speed of said supply reel and generating an output signal which varies with a change in said rotational speed and which has a rate of change corresponding to the rate of said change of the rotational speed; means receiving said output signal for generating a motor control signal which varies in response to changes in said output signal with the relationship of the variation of said motor control signal to the variation of said output signal being dependent on said rate of change of the output signal; and means for controlling the torque applied by said motor in dependence on said motor control signal, in which said means for generating a motor control signal includes an input terminal receiving said output signal an amplifier having inverting and non-inverting inputs and an output, first and second resistors connected between said input terminal and said inverting input and between said input terminal and said non-inverting input, respectively, a feedback resistor connected between said output of the amplifier and said inverting input, and a capacitor connected to said noninverting input of said amplifer.

4,289,285

MAGNETIC TAPE CASSETTE

Toshihiko Ishida, Komoro, and Takateru Satou, Saku, both of Japan, assignors to TDK Electronics Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 697,995, Jun. 21, 1976, abandoned.
This application Apr. 25, 1980, Ser. No. 143,725
Claims priority, application Japan, May 27, 1975, 50-71056
Int. Cl.[3] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—199 9 Claims



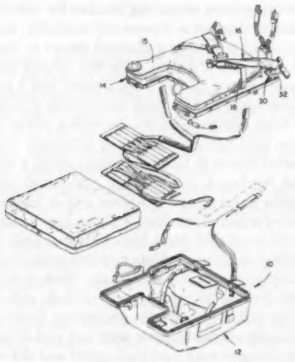
1. In a separation sheet for a magnetic tape cassette comprising a sheet to be positioned between an inner wall and the tape reels of a cassette, the improvement in which the sheet is formed with at least one dome-like protrusion, in which said sheet is formed with an additional protrusion on a side of said sheet opposite from that containing said dome-like protrusion and shaped to fit into a window formed in said inner wall of said cassette.

4,289,286

REPLACEABLE HARNESS BRACKET ASSEMBLY

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Farmingdale, N.Y.

Filed Oct. 16, 1978, Ser. No. 951,856
Int. Cl.[3] B64D *25/00*
U.S. Cl. 244—1 R 24 Claims



1. A disconnect device for an aircraft survival kit including a container and a lid secured thereto with a torso harness and anti-rotation strap associated therewith, said disconnect device comprising:

A. a body adapted to be mounted relative to said kit,

B. support means extending outwardly from said body and including a cavity adapted to receive an end of the harness therein,

C. locking means adapted to extend through said support means and said end of the harness to provide securement of the harness to the kit so as to obtain removal of the harness from the disconnect device for replacement thereof when said locking means is disengaged such that the lid may remain secured to the container when the harness is replaced,

D. said support means includes a pair of spaced apart arms integrally joined with said body and defining said cavity for receiving said end of the harness therebetween,

E. said locking means includes a pair of socket holes extending through said support means, and a fastener extending through said arms and said end of said harness,

F. anti-rotation means adapted to be coupled to said kit in fixed spaced relationship to said body for retaining the strap of the harness,

G. securing means for said anti-rotation means so as to permit removal of the strap when replacement of the harness is desired, and

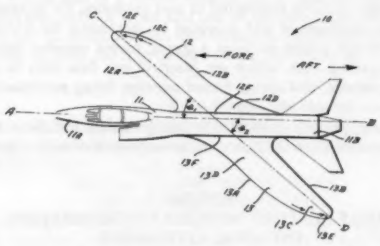
H. one pair of said body and said anti-rotation means is provided for each said kit.

4,289,287

FIXED SKEWED WING AIRBORNE VEHICLE

Richard D. Child, Huntington Beach, Calif., and Jan R. Tulinus, Newport News, Va., assignors to The Unites States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 621,330, Oct. 10, 1975, abandoned. This application Jun. 17, 1977, Ser. No. 807,618
Int. Cl.[3] B64C *3/10*
U.S. Cl. 244—45 R 1 Claim



1. In an airborne vehicle of the fixed-wing type intended for use at supersonic speeds, wherein said airborne vehicle has a fuselage with a longitudinal axis, a starboard wing section, a port wing section, and a span-wise axis common to both said wing sections, and wherein each said wing section has a leading edge, a trailing edge, an outboard end, and an inboard end, and also wherein each said wing section has a tip at said outboard end and a root area at said inboard end, the improvement comprising:

(a). said wing sections fixedly disposed, with said starboard wing section disposed fore and said port wing section disposed aft, and with said common span-wise axis of said starboard and said port sections disposed in a skewed position at an angle of **45** degrees to said longitudinal axis of said fuselage;

(b). said leading edge and said trailing edge of each said wing section, at said root area thereof, configurated to blend with and to said fuselage;

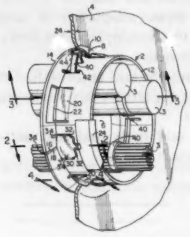
(c). and, said tip of said fore disposed starboard wing section is so configurated that said trailing edge thereof is swept forwardly and said leading edge thereof is essentially straight relative to said trailing edge and said tip of said aft disposed port wing section is so configurated that said leading edge thereof is swept rearwardly and said trailing edge thereof is essentially straight relative to said leading edge.

4,289,288

WIRE ROUTING APPARATUS

N. Keith Gransberry, Birdsboro, and Allen C. Haggerty, Media, both of Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 2, 1978, Ser. No. 947,345
Int. Cl.[2] F16L *5/00*
U.S. Cl. 248—56 **6 Claims**



1. A routing apparatus for connecting cables and the like to a wall having a hole therein, which comprises:

a split ring grommet having a slit along its longitudinal axis which includes, a cylindrical body having a flange at one end thereof, an edge at the opposite end thereof, and spring biased means for engaging the wall between said spring biased means and said flange;

means, operably connected to said grommet, for securing the portions of the grommet opposing said slit to one another;

means, operably connected to said grommet, for increasing the diameter of said grommet by increasing the width of said slit which includes a spring biased member having opposing ends which are inserted into first slots in said grommet, said spring biased member being positioned to over-lap said slit; and

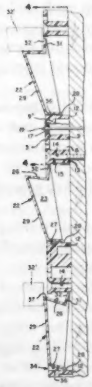
means, operably connected to said grommet, for connecting the cables and the like to the inner portion of said cylinder.

4,289,289

SHELF SUPPORT MEMBER INCORPORATING INTEGRAL LIVE HINGE

Sherman A. Overman, Hollister, Calif., assignor to Monterey Shelf, Inc., Hollister, Calif.

Filed Oct. 22, 1979, Ser. No. 87,216
Int. Cl.[3] A47B *57/08*
U.S. Cl. 248—235 **7 Claims**



1. A shelf support strip, comprising:

(a) an elongated base member formed from injection-molded synthetic resinous material; and

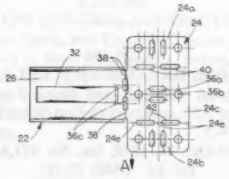
(b) a series of integral injection-molded synthetic resinous material shelf support members longitudinally spaced on said base member and pivotal thereon between a retracted position and an extended shelf-support position to provide a shelf support surface perpendicular to said elongated base member when in extended shelf-support position and a force transferring portion connecting said perpendicular shelf support surface to a force transferring surface separable from said elongated base member when said shelf support members are in retracted position but abutting said base member when said shelf support member is in extended shelf-support position whereby a force imposed on said shelf support surface is transferred to said elongated base member through said force transferring portion and said force transferring surface.

4,289,290

UNIVERSAL DRAWER SLIDE MOUNTING BRACKET

Calvin K. Miller, Grand Rapids, Mich., assignor to Knape & Vogt Manufacturing Co., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 850,407, Nov. 10, 1977, Pat. No. 4,141,525. This application Jan. 25, 1979, Ser. No. 6,454
The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.
Int. Cl.[3] A47B *88/00*
U.S. Cl. 248—251 **2 Claims**



1. An omni orientation mounting bracket for selective multiple position use to support a drawer rail assembly, comprising:

a one piece bracket having a channel sleeve to interfit with a drawer rail, and a mount plate for cabinet attachment; said channel sleeve having a back panel and a pair of side panels transverse to said back panel, said panels forming an open front end to receive a mounting rail in said channel sleeve; said mount plate being integrally joined with said channel sleeve at said back panel along a linear juncture, and having a plurality of peripheral edges; said mount plate having plate portions and at least two bend lines, one of which bend lines is along said linear juncture and the other of said bend lines between said plate portions to allow said mount plate portions to be positioned in selected orientation relative to said channel sleeve; said bend lines having aligned spaced orifices and isthmuses therealong; and a spring clip projecting from said back panel into said channel sleeve with one end of said spring clip being integral with said back panel and the remainder thereof projecting toward said open end to form a slot between said spring clip and said back panel.

4,289,291

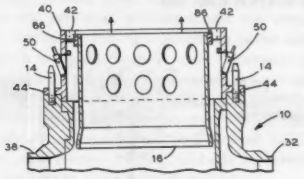
RETRACTABLE STORAGE LUG

Donald L. Goddard, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 18, 1978, Ser. No. 970,776
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—293 **14 Claims**

1. A support device for stacking and storing articles comprising a pair of parallel support plates, a pair of opposed independent coplanar pins extending inwardly from the plates, support means disposed between the plates and pivotally suspended by the pins, the pins partially extending through the

support means, a cylindrical member slidably and coaxially disposed within the support means, the member slidably and rotatably engaging the pins, a weight attached to the member,



means for rotating the member and means for affixing the device to the article to be stored.

4,289,292

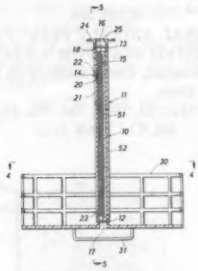
VARIABLY SUPPORTED CONTAINER

Varughese Kunjumon, 3706 N. Greenwood, Victoria, Tex. 77901

Filed Jun. 15, 1979, Ser. No. 48,972

Int. Cl.³ F16M *11/00*

U.S. Cl. 248—333 **10 Claims**



1. Apparatus for suspending articles from a support at a plurality of elevations, comprising

a first guide member means attachable to said support,

a second guide member means in slidably coaxial engagement with said first guide member means,

container means attached to said second guide member means for containing said articles,

spring means connected between said first and second guide member means for urging said second guide member means toward said support,

locking means for preventing said slidably coaxial engagement when said first and second guide member means are substantially separated comprising a portion of said first guide member means defining a groove and extension means carried by said second guide member means in matingly slidable engagement with said groove.

4,289,293

COMBINATION BED CONCRETE CASTING APPARATUS

Jerry L. Cashion, Nashville, Tenn., assignor to Span-Deck, Inc., Franklin, Tenn.

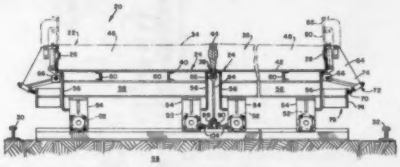
PCT No. PCT/US79/00707, § 371 Date Sep. 7, 1979, § 102(e) Date Sep. 7, 1981, PCT Pub. No. WO80/00672, PCT Pub. Date Apr. 17, 1980.

Continuation-in-part of Ser. No. 947,866, Oct. 2, 1978, abandoned. This PCT application filed Sep. 7, 1979, Ser. No. 83,993

Int. Cl.³ B28B *7/02*

U.S. Cl. 249—74 **20 Claims**

1. A combination bed casting aparatus for casting either a single elongated concrete structural member in a single elongated casting bed section or for simultaneously casting two elongated concrete structural members in side-by-side parallel elongated casting bed sections comprising a longitudinally extending bottom wall form and oppositely disposed side wall forms, the bottom wall form being divided longitudinally into two supporting sections for supporting the structural member(s) to be cast, the two sections adapted to be positioned in abutting relationship to form with said side wall forms the single casting bed section and spaced from each other by an elongated intermediate wall form, first means for positioning said sections and second means for positioning the intermediate wall form between said two supporting sections and generally



parallel to the side wall forms to form with each supporting section and an associated side wall form the side-by-side casting bed sections, said supporting sections and its associated side wall form being moveable transversely to the longitudinal axis of the casting apparatus wherein said second means comprises a lifting mechanism for pivotally positioning the intermediate form by the lifting mechanism in a first position below said moveable section when said two supporting sections are positioned in abutting relationship for forming the single casting bed section and in a second position above and between said supporting sections when said one of the two supporting sections and its associated side wall forms have been moved transversely to form the side-by-side casting bed sections.

4,289,294

WELLHEAD FLOW CONTROL DEVICES

Douglas K. McLean, Dallas, Tex., assignor to Double-E, Inc., Dallas, Tex.

Filed Jan. 14, 1980, Ser. No. 111,604

Int. Cl.³ F16K *31/143, 41/02*

U.S. Cl. 251—62 **41 Claims**

1. In a flow control device for a wellhead which passes a polished rod of a pump sucker rod string

a valve for controlling the wellhead flow comprising a body providing an axial flow passage and circumambient closure seat, and a coacting closure ram guided for axial reciprocating movement relative to said closure seat; said closure seat and said closure ram being configured for coaxial association with the polished rod;

said closure ram comprising an elongated body, a compressible packing mounted at the closure end of said body for seating in said closure seat, and retaining means for axially retaining said packing on said body;

said closure seat comprising a shoulder confronting a peripheral portion of said ram packing;

and operator means for moving said ram to a first position into sealing engagement with said closure seat wherein said packing is urged into sealing engagement with said polished rod, and to a second position wherein said packing is displaced and unsealed from said closure seat and said polished rod.

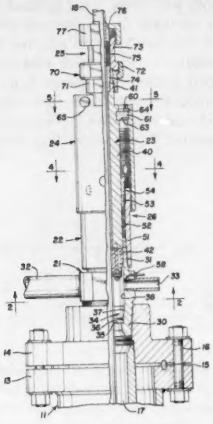
24. A device as set forth in claim **1** characterized by

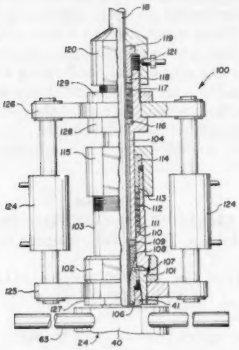
said valve body comprising a sleeve portion at its upper end;

an operator sleeve disposed over said valve body sleeve portion for axial movement relative thereto; a thrust coupling mounted between said operator sleeve and said ram body, for transferring axial thrust forces therebetween; and means for reciprocating said operator sleeve relative to said valve body;

a packing gland for said ram body comprising said ram body

upper cylindrical portion, and an annular externally threaded packing nut threaded into the distal end of said valve body sleeve portion;





said packing nut having external peripheral indentions for engagement by a driving tool to effect rotation thereof; and said operator sleeve having a plurality of axially spaced access holes for said driving tool.

4,289,295

SELF-SEALING CONNECTOR

Alan R. Allread, Jackson, Mich.

Filed Nov. 6, 1978, Ser. No. 958,132
Int. Cl.³ F16L *37/28*
U.S. Cl. 251—149.2 **14 Claims**

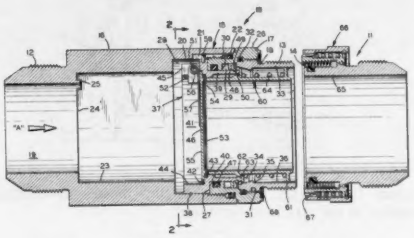
1. In a valve connector of the type having a pair of interconnectable body members, each having a central passage extending therethrough, a valve member pivotally mounted in the passage of one of the body members wherein the valve member is in a position closing the passage when the body members are uncoupled and in a position opening the passage when the body members are coupled and connecting means for interconnecting the body members, the improvement comprising:

(a) a piston axially slidably mounted within said one body member and having a central aperture with the passage in said one body member;

(b) said valve member being pivotally mounted on said piston over the central aperture therein and pivotal between positions closing and opening the central aperture;

(c) means for urging said piston to a first position whereat said valve member closes the aperture in said piston when said body members are in the uncoupled state;

(d) means for pivoting said valve member from its closed position to its open position when said body members are in the coupled state; and



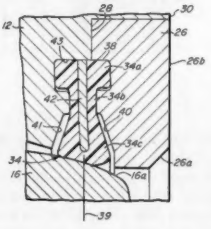
(e) means for axially moving said piston and said open valve member to a second position interlocking said valve member to said one body member when said body members are in the coupled state.

4,289,296

BIDIRECTIONAL AXIALLY PLIANT PRESSURE ASSISTED SEAT FOR A VALVE

Bernd Krause, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Mar. 23, 1979, Ser. No. 23,298
Int. Cl.³ F16K *1/22*
U.S. Cl. 251—306 **4 Claims**



1. A butterfly valve with a pressure assisted seat member, which comprises:

(a) a valve body having a central bore therethrough;

(b) a disc member mounted in said bore and movable between an open and closed position about an axis transverse to said bore and having a peripheral sealing surface;

(c) an annular recess circumscribing said bore and disposed in radial alignment with said sealing surface of said disc member when said disc member is closed;

(d) a symmetrical seat member formed of a fluorinated hydrocarbon polymer supported in and extending radially inward from said annular recess to selectively and sealingly interface with said sealing surface on said disc member, said seat member including:

(i) a first portion secured within said annular recess;

(ii) a second portion disposed radially inward with respect to said first portion and having an axial dimension which is smaller than the axial dimension of said first portion;

(iii) a third portion disposed radially inward with respect to said second portion and having an axial dimension which is greater than the axial dimension of said second portion;

(e) means for compressingly engaging the second portion of said seat member, said seat member cooperating with said

disc member to axially flex the seat member at the second portion, said engaging means serving to concentrate axial flexure at that location;

(f) a continuous support membrane within said seat extending radially inward from said first portion of said seat member into said third portion of said seat member, said support membrane having a dimension in the radial direction which is greater than its axial dimension and being axially pliant to urge the seat member to a predetermined position in response to axial deflections; and

(g) side walls extending radially inward from said annular recess which are proximate to said seat but axially spaced from the third portion thereof, said side walls being operative to limit axial movement of said seat.

4,289,297

BUTTERFLY VALVE

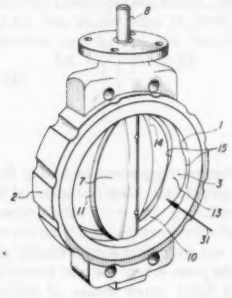
Mikimaro Nakanishi, Yao, Japan, assignor to Tomoe Technical Research Company, Osaka, Japan

Filed Apr. 8, 1980, Ser. No. 138,351

Claims priority, application Japan, Apr. 20, 1979, 54/48042; May 15, 1979, 54/58717

Int. Cl.³ F16K *1/22*

U.S. Cl. 251—306 **6 Claims**



1. A butterfly valve comprising:

an annular valve body,

a disk-shaped valve member having a rotation axis and pivotally mounted on said annular valve body at each end of said rotation axis to open or shut a fluid path defined by said annular valve body, and

a seat ring having an annular sealing surface disposed between said valve body and said valve member to ensure shutting of the fluid path by said valve member,

said sealing surface having two first surfaces each being in the vicinity of the corresponding end of said rotation axis and two second surfaces each extending from one of said first surfaces to the other first surface, each of said second surfaces having substantially a maximum width in the middle position between said first surfaces, the width of each of said second surfaces gradually enlarging from the position adjacent to said first surfaces to said middle position of the said second surface wherein peripheral edges formed on each side of each second surface define said width, said peripheral edges each having a curve defined with a part of a trigonometric function.

4,289,298

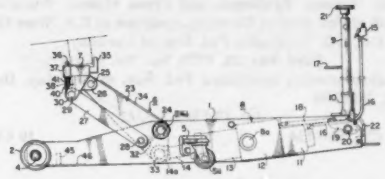
HYDRAULIC LIFTING JACK HAVING A SAFETY LIFTING SADDLE

Tamotsu Kameda, Fujinomiya, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed Dec. 27, 1979, Ser. No. 107,666

Int. Cl.³ B66F *5/04*

U.S. Cl. 254—8 B **7 Claims**



1. A lifting jack, comprising: a base; an elevator which is mounted to the base so as to be raisable and lowerable; a lifting saddle disposed at the free end of the elevator; power means adapted to raise and lower the elevator; at least one movable stop means mounted to the lifting saddle so as to be movable in a substantially vertical direction; and actuating means coupled to said movable stop means and adapted to automatically raise said movable stop means to project above the lifting saddle upper surface when the elevator is raised, and further adapted to automatically lower said movable stop means so as not to project above the lifting saddle upper surface when the elevator is lowered beyond a certain point.

4,289,299

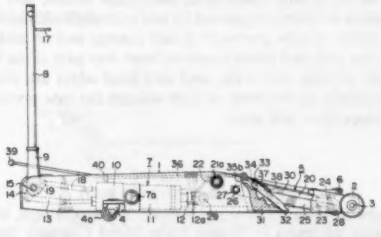
HYDRAULIC LIFTING JACK INCLUDING A SAFETY DEVICE FOR AN ELEVATOR THEREIN

Tamotsu Kameda, Fujinomiya, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed Dec. 31, 1979, Ser. No. 108,644

Int. Cl.³ B66F *5/04*

U.S. Cl. 254—8 B **2 Claims**



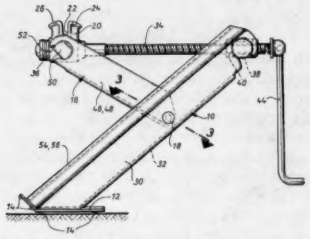
1. A lifting jack having a pair of frame plates, with an elevator pivotally mounted to said pair of frame plates; and having a lifting saddle arranged at the free end of said elevator; and a power unit, mounted to said pair of frame plates, for lifting said elevator, and comprising: a safety device for the elevator including support block means pivotally mounted to said elevator, step block means having a front slope surface and a plurality of stop steps in said front slope surface, and said step block means being secured to said pair of frame plates; a lever coupled to said support block means, and spring means; said lever being adapted to move said support block means between an engaging position wherein said support block means engages with said step block means and a disengaging position wherein said support block means is disengaged from said step block means, and said spring means being adapted to retain said support block means in either the engaged position or the

disengaged position in such a manner that in being moved between the engaged and disengaged positions, said support block passes through a dead point, whereby should said elevator fall, the engagement of said support block means with said step block means prevents the collapse of the lifting jack.

4,289,300
CAR JACK

Dieter Weisser, Tuttlingen, and Franz Hafner, Wurmlingen, both of Fed. Rep. of Germany, assignors to E.A. Storz GmbH & Co., KG, Tuttlingen, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 97,911
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1978, 2851980
Int. Cl.³ B66F *3/12*
U.S. Cl. 254—126 **10 Claims**



1. A car jack comprising a column having a top end and a bottom end, a load-carrying arm, a cross-pivoting shaft, a screw spindle, a base, a crank handle, a screw spindle nut, and a screw spindle abutment, said column being formed of metal section of U-shaped cross-section, said metal section of said column having side walls with internal flat side portions and edge parts outwardly bent and shaped as beads with edges, wherein said bottom end of said column is attached to said base, said load-carrying arm is supported on said cross-pivoting shaft which is attached to said column and is pivotable by said screw spindle operable by said crank handle, said screw spindle is pivotably supported by said screw spindle nut and by said screw spindle abutment at said column and on said load-carrying arm, said beads extend at least over part of the length of said column side walls, and said bead edges are disposed substantially in the plane of said internal flat side portions of said respective side walls.

4,289,301
POST FOR A GUARD RAIL

Noboru Akabame, Tama, and Hitoshi Yoshino, Tokyo, both of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Oct. 9, 1979, Ser. No. 83,168
Claims priority, application Japan, Oct. 13, 1978, 53-125091; Jan. 31, 1979, 54-10009
Int. Cl.³ E01F *15/00*
U.S. Cl. 256—13.1 **15 Claims**

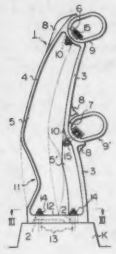
1. A post for a guard rail to be secured on a curb arranged at a side of a highway, said post comprising:

a post body formed of metal and having an I-shape in horizontal cross-section with a front flange and a rear flange formed on the front and rear portions of a web;

at least one fitting portion on said front flange facing the highway for receiving said guard rail;

said post having a mechanical neutral plane which is an S-shaped curve; and

a first portion of the mechanical neutral plane of substantially the upper half portion of said post body being upwardly inclined towards the highway, and a second portion of the mechanical neutral plane of substantially the



lower half portion of said post body having a curved plane protruding towards the highway.

4,289,302
FENCE ARRANGEMENT

J. L. Montgomery, 2565 Cherosen Rd., Louisville, Ky. 40205

Filed Jan. 7, 1980, Ser. No. 110,227
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—19 **2 Claims**

1. A precast fence arrangement including first and second elongate post means of cast, hardened material having a multiplicity of faces including wire mesh reinforcement within said post and inset a selected inset distance from the selected closest faces of the post and extending longitudinally along a portion of the length of the posts where the post means include at least one pair of inset blind notch means of selected peripheral configuration each in aligned relation with respect to a traverse plane through said post and each in a different one of said selected faces thereof where the depth of said notches is less than the corresponding selected inset distance; and elongate rail of cast, hardened material with first and second opposite ends of pheripheral configuration adapted to be received in the notch means of adjacent post means.

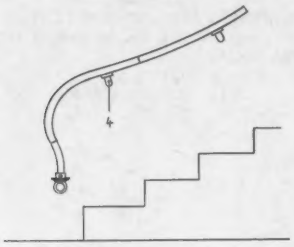
4,289,303
HAND-RAIL ELEMENT FOR STAIRCASE

Wilfried Hamm, IM Wiesengrund 28, 4330 Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 56,930
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 7901946[U]
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—69 **3 Claims**

1. A hand-rail assembly for a staircase comprising a plurality of hand-rail elements, each element having a soft metal core of tubular shape with a thin side wall thickness such that the metal core is easily bent by hand, each element having a pliable foamed polyurethane covering surrounding said tubular core and having a thickness at least approximately equal to the

diameter of said core, a plurality of nipples connecting said hand-rail elements end-to-end, each nipple having opposed male threaded portions threadably received in the adjacent end



portions of two end-to-end hand-rail elements, each nipple having a flange, and each pliable covering having one end recessed to receive said flange.

4,289,304

SEAT CONSTRUCTION

Stephen E. Muzzell, Ferndale, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Continuation of Ser. No. 40,690, May 21, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 203,628

Int. Cl.³ F16F *3/02*

U.S. Cl. 267—112 **17 Claims**

1. A seat construction comprising a frame having spaced parallel rails,

a spring assembly comprising a pair of transversely spaced longitudinally extending wires,

each said wire having a resilient layer thereon,

said spring assembly including a plurality of transversely extending wires having portions wound only partially about said layers of said longitudinally extending wires,

said spring assembly including an auxiliary longitudinal wire positioned on said transverse wires, spaced between and extending parallel to said first-mentioned longitudinal wires and substantially coplanar therewith,

each transverse wire having a free end extending over and engaging on the adjacent auxiliary longitudinal wire to tend to hold and lock the transverse wires firmly in position relative to the first-mentioned longitudinal wires and to form a connection between the auxiliary longitudinal wire and the first-mentioned longitudinal and transverse wires of the spring assembly,

and a plurality of tension springs having one end connected to a first-mentioned longitudinally extending wire of said spring assembly and the other end to a rail of said frame.

4,289,305

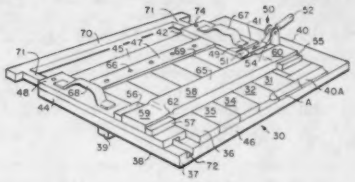
WORK PIECE HOLDER FOR WOODWORKING MACHINE

Gary W. Penner, 700 Ranchitos del Sol, Aptos

Filed Dec. 14, 1979, Ser. No. 103,569

Int. Cl.³ B25B *1/24*

U.S. Cl. 269—43 **7 Claims**



1. A work piece holder for a woodworking machine wherein said machine has a power-driven cutting tool, a table adjacent the cutting tool over which the work pieces are progressed, a guide on said table for guiding the work pieces and a power feeder having power-driven wheels for contacting and feeding the work past the cutting tool, said work holder comprising:

a base on which a plurality of work pieces are placed;

a first ledge on one side of said base forming an edge against which the work pieces are aligned;

clamping means for exerting and edgewise pressure on said work pieces to hold them tightly in alignment with said ledge;

a holding member fitting over the work pieces and aligned with the power-driven wheels of the power feeder and including a top surface on which the wheels can ride; and

means for guiding said work piece holder along said table guide to bring the work pieces into contact with said cutting tool.

4,289,306

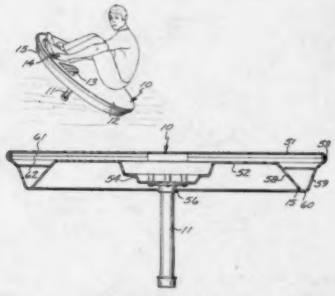
EXERCISE WHEEL

Ross T. Thomas, 1507 Lincoln, Corona, Calif. 91720

Filed Oct. 29, 1979, Ser. No. 89,604

Int. Cl.³ A63G *1/12*

U.S. Cl. 272—33 R **6 Claims**



1. In an exercising device that includes a circular platform that has a periphery on which it rolls, a stub shaft projecting outwardly from the center of said platform, said stub shaft having a free end, said free end and periphery cooperating when a user is mounted on said platform to roll on a flat surface in a circular path about the contact of said free end with said flat surface by said user shifting his weight, the improvement comprising:

a. an upper surface half that has an upper surface and a lower surface, and an outer periphery defined by a downwardly

curved first lip, a first ring of greater depth than said first lip that extends downwardly from said lower surface and is radially spaced from said first lip, said upper half having a pair of foot receiving openings and a pair of hand receiving openings therein;

b. a lower surface half of the same diameter as said upper half, said lower surface half having an upper surface and a lower surface, a periphery defined by a second curved lip that extends upwardly therefrom, a second ring that extends upwardly from said upper surface of said lower surface half, said second ring of greater depth than said second curved lip, said lower surface half having a circular convolution that extends downwardly adjacent said second curved lip, and a boss that extends downwardly from substantially the center of said lower surface half;

c. a pipe flange secured to said boss and that receives said stub shaft;

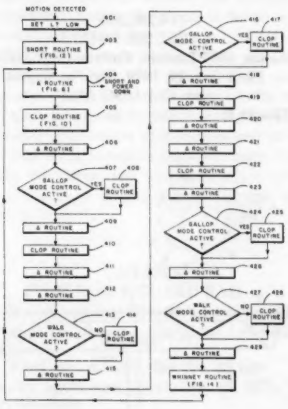
d. a circular resilient strip that in transverse cross section defines a rectangular anchor, a neck extending outwardly from said anchor, and a crescent shaped member that has said neck secured to substantially the center thereof, said upper and lower surface halves when said first and second rings are disposed in abuting contact defining a circular confined space in cooperation with said first and second lips in which said anchor is disposed with said neck extending through a gap defined between said first and second curved lips, and said crescent shaped member engaging said first and second curved lips to removably hold said first and second half surfaces together as an integral unit.

4,289,307

RIDING TOY WITH SOUND EFFECTS

Trevor J. Marshall, Jr., Westport, Conn., and Darryl R. Dworkin, Middlesex, N.J., assignors to CBS Inc., New York, N.Y.

Filed Feb. 9, 1979, Ser. No. 10,780
Int. Cl.³ A63G *17/00*
U.S. Cl. 272—52.5 **22 Claims**



1. A riding toy comprising:

a model horse resiliently mounted to allow a rider thereof to cause motion of the horse having vertical and horizontal motion components;

means for detecting horizontal and vertical components of motion of said horse;

means for generating a trotting gait sound in response to the output of said vertical motion detection; and

means for generating a walk or gallop gait sound in response to said horizontal motion detection;

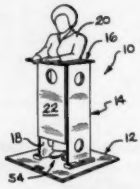
said means for generating said gait sounds including means for selecting, in accordance with a prescribed priority, which of said gait sounds is to be generated when said motion detection would otherwise result in the generation of more than one gait sound.

4,289,308

PORTABLE THERAPY ENCLOSURE

Anna M. Allen, and Donna I. Pudvan, both of 115 McTigue, Toledo, Ohio 43615

Filed Jan. 2, 1979, Ser. No. 190
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—70 **5 Claims**



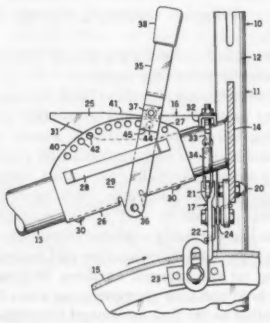
1. A demountable therapy enclosure for assisting the reestablishment of walking skills of a person comprising, in combination, four generally vertically disposed walls, said walls including front and back opposed walls and two opposed side walls, having lower marginal edges, said walls defining a rectangular volume open at the upper end, said front and back walls spaced apart at a distance which maintains the legs of a person disposed in said volume in substantially vertical orientation, said front wall having a lower marginal edge disposed above said lower marginal edges of said side walls, hinge means for pivotally interconnecting said four walls along three spaced apart hinge axes, at least one latch means for selectively securing two of said walls to one another, a generally planar base disposed beneath said walls, means for selectively engaging said said walls to said planar base, said just recited means including a pair of outward projections each adjacent a respective one of said lower marginal edges of said side walls and a pair of cooperating overhanging lips disposed on said planar base.

4,289,309

WORK CONTROL ASSEMBLY IN AN EXERCISER

Ralph L. Hoffmann, St. Louis, Mo., assignor to The Perfection Manufacturing Company, St. Louis, Mo.

Filed Nov. 13, 1979, Ser. No. 93,920
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—73 **5 Claims**

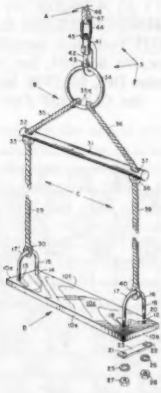


1. A work control assembly in an exerciser having a frame, and a driven member rotatively mounted on the frame, the assembly comprising:

(a) a brake means operatively mounted on the exerciser frame and engaging the driven member,

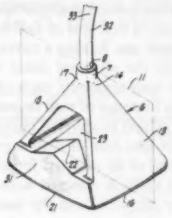
(b) a lever means pivotally carried by the frame and connected to the brake means for exerting braking pressure on the driven member,
(c) resilient means operatively connected between the brake means and lever means tending to resist pivotal movement of the lever means in one direction,
(d) control means movably carried by the frame and slidably engaging the lever means for pivoting the lever means and holding the lever means in a selected pivoted position against the action of the resilient means for determining the braking pressure,
(e) the lever means including a bearing margin,
(f) the control means including a pivotably mounted arm slidably engaging the lever means along the bearing margin for pivoting the lever means while slidingly engaging the lower means, and
(g) the control means including a locking means for retaining the control arm in an adjusted predetermined position.

4,289,310
SWING APPARATUS
Terence S. Weakly, 701 E. King, Kingsville, Tex. 78363
Continuation of Ser. No. 838,621, Oct. 3, 1979, abandoned. This application Oct. 22, 1979, Ser. No. 87,141
Int. Cl.[3] A63G *9/00*
U.S. Cl. 272—85 **1 Claim**



1. A swing apparatus for amusement and exercising, comprising:
a generally rectangular horizontal seat having two vertical, space parallel flexible cables secured thereo;
a cross bar member connected with the vertical cables to maintain the two cables spaced and parallel;
a ring means connected with the two cables;
a hook member having a spring biased closure pin for releasable receiving the ring means and an eye member attached to the hook member through a swivel joint;
a single vertical cable member having a first loop through which the eye member is connected and a second loop connected to a ring for supporting the swing apparatus;
the cross bar member having openings at opposite ends, for receiving one of the two spaced flexible cables in each of the openings;
the spaced flexible cables including a first cable secured with one side of the seat and extending upwardly through one of the openings in the cross bar member, and extending upwardly at an angle and secured to the ring means and a second cable secured to the ring means and extending downwardly at an angle to the cross bar member and downwardly to the other side of the seat and secured thereto;
the cables including knots therein just below the cross member bar openings to maintain the cross bar member horizontal at a predetermined position;
and the generally rectangular horizontal seat having inverted U-shaped connectors extending through openings at each side thereof for connecting the seat with the first and second cables; and
said generally rectangular, horizontal seat having rectangular recesses on the lower seat surface for receiving reinforcing strap members that have the same general dimensions as the recesses and that are connected with the inverted U-shaped connectors.

4,289,311
GOLF CLUB
Harry A. Smith, 8460 Kings Cove Dr., Salt Lake City, Utah 84121
Filed Sep. 7, 1979, Ser. No. 73,264
Int. Cl.[3] A63B *53/04*
U.S. Cl. 273—167 F **3 Claims**

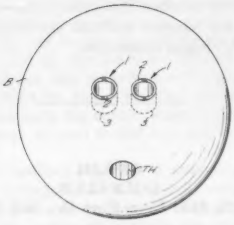


1. A golf club having a configuration substantially symmetrical on opposite sides of a central vertical plane comprising a unitary body having a lower portion and an upper portion and in said upper portion having a cylindrical socket with a bottom end and with the socket axis vertically disposed in said plane, said body in said lower portion including a ground panel substantially square in outline in a plane normal to said vertical axis, said ground panel having a forward edge margin and a rearward edge margin parallel to each other and normal to said central plane and having a pair of substantially parallel side margins extending parallel to said vertical plane and between said forward edge margin and said rearward edge margin, said ground panel being disposed with the center thereof substantially on said axis and having an upper portion spaced a substantial distance below said socket, said body including a forward solid panel substantially triangular in outline with a forward apex merging with said socket and a forward base merging with said forward edge margin of said ground panel, said body including a rearward solid panel substantially triangular in outline with a rearward apex and a rearward base merging with said socket and said rearward base merging with said rearward edge margin of said ground panel, said forward and rearward panels, said bottom end of said socket and said upper portion of said ground panel being spaced apart to leave an opening between them, and said body including a hump upstanding from at least the central portion of said upper portion of said ground panel between and spaced from said forward panel, said rearward panel and said socket and extending to at least one of said side margins of said ground panel, said hump being normal to said vertical plane and symmetrical about a vertical plane through said axis, and means defining an impact face upstanding from at least one of said side margins of said ground panel substantially midway between said forward panel and said rearward panel.

4,289,312
FINGER GRIP INSERT FOR A BOWLING BALL

Donald L. Heimbigner, 9605 SE. 6th St., Vancouver, Wash. 98664

Filed Apr. 21, 1980, Ser. No. 142,407
Int. Cl.[3] A63B *37/00*
U.S. Cl. 273—63 A 2 Claims



1. A finger grip insert for bowling balls, said insert comprising,

a tubular resilient body having an outer wall for recessed securement within a bowling ball bore, and

wall segments of the tubular resilient body extending lengthwise of said body, a first pair of said wall segments each of uniform thickness and having a curved inner wall surface concentric with the adjacent outer wall of the insert, a second pair of wall segments each of a greater thickness than that of the first pair of wall segments and each having an inner wall of less transverse curvature than the inner surfaces of said first pair of wall segments whereby adequate cushioning of an inserted finger tip bearing on one of said second walls is effected without impeding finger tip insertion or removal from the insert.

4,289,313
MANAGEMENT TEACHING GAME APPARATUS AND METHOD

Robert P. Delamontagne, 284 Westcott Blvd., Pennington, N.J. 08534

Filed Sep. 7, 1979, Ser. No. 73,200
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—256 11 Claims

1. A competitive management teaching game-like apparatus for teaching at least two competitive players useful information about their respective jobs comprising:

a gameboard having a first player territory representing the real life work environment of said first player, a second player territory representing the real life work environment of said second player, a path connecting said first and second player territories together and a plurality of player positions representing real life work situations located along said path, said player positions having predetermined penalty and reward values;

at least a first and second player piece;

chance means for determining the player positions of said player pieces on said path of said gameboard;

question means for posing identified questions and multiple choice answers to said identified questions concerning specific subjects related to the real life work of said players, said player positions within said first and second territories referring said first and second players to questions from said question means corresponding to different categories of subject matter, said question means posing substantially differently identified questions and answers to each player respectively;

answering means for determining the correctness of an answer to the identified question posed by said question means, said answering means comprising an electronic device preprogrammed to indicate the correctness of any one of said identified multiple choice answers to any one of said identified questions posed by said question means in such a way that both players know if a question is answered correctly, but only the player using the answering means know the content of the multiple choice answer selected;

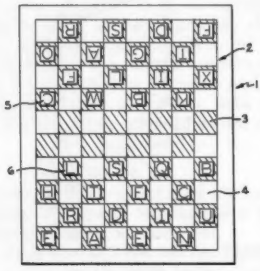
cumulative scoring means for providing a cumulative reward corresponding to said player positions; and,

a reward means.

4,289,314
WORD FORMING CHECKERS GAME METHOD

Gary M. Berlino, 5731 Yorkshire, Detroit, Mich. 48224

Continuation of Ser. No. 806,994, Jun. 16, 1977, abandoned.
This application Dec. 15, 1978, Ser. No. 969,671
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—260 1 Claim



1. A competitive game playing method comprising the steps of:

placing a plurality of game playing pieces, each of which includes a plurality of faces each face being provided with a letter of the alphabet, with a significant number of alphabet letters being provided on the various faces and more than one different letter being provided on the various faces of each of the plurality of playing pieces, on a game playing surface having a checkered pattern of spaces;

in every second space in four laterally arranged rows with each row being offset one space from an adjacent row and being diagonally related to adjacent rows, and in two opposed sets of rows, with one letter on each piece facing upwardly;

selecting alternately in turn with an opponent, one of said pieces as a pivotal piece by inspecting more than one face of at least one piece and selecting one of said letters on one of said faces on one of said pieces to be a pivotal letter and arranging the latter said piece on said board with the selected pivotal letter facing upward;

moving said pivotal piece along a diagonal line on said surface toward opposing or friendly pieces into an open space in which said pivotal piece will be in a position in respect to the latter of said pieces wherein words in which

said pivotal piece pivotal letter plays a part will be formed with a series of letters on adjacently positioned pieces along diagonal paths; and

observing the number of words so formed on each such move and recording a total value thereof in accordance with a prearranged numerical value related to the number of letters in each observed word.

4,289,315

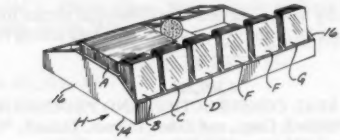
GOLF SIMULATING GAME

Vernon L. O'Barr, 360 Park Central, Mira Loma, Calif. 91752

Filed Jul. 28, 1980, Ser. No. 172,677

Int. Cl.³ A63F *1/04, 1/10*

U.S. Cl. 273—298 **1 Claim**



1. In a game that simulates the actual playing of a round of golf over a course for which a course card is provided that lists the holes by number, distance in yards, and par, a plurality of decks and opaque playing cards, each card in each deck having first and second sides, said first sides of said cards in each of said decks being identified by an insignia that visually indicates the same particular act in the playing of a game of golf and said second sides of said cards in each of said decks having a plurality of different printed messages thereon that indicate the degree of success achieved in carrying out said particular act identified on said first side thereof, the combination with said plurality of decks and said course card of a device that preferably permits a plurality of players grouped about a horizontal surface to play said game, said device including:

a. a tray assembly that includes a flat rectangular bottom that has a pair of end edges and first and second side edges; a pair of end walls that extend upwardly from said ends; first and second side walls of substantially less height than that of said cards that extend upwardly from said first and second side edges; third and fourth side walls that extends upwardly from said bottom and disposed inwardly a substantial distance from said first and second side walls, said third and fourth side walls of substantially greater height than said first and second side walls; a plurality of longitudinally spaced first transverse partitions that extend between said first and third side walls and in co-operation with the latter and said end walls define a plurality of playing compartments in which said plurality of decks are removably disposed in inwardly inclined positions with said first sides facing outwardly; and a plurality of longitudinally spaced, transverse second partitions that extend between said second and fourth side walls and in co-operation with the latter and said end walls define a plurality of discard compartments in which said cards are placed after being played;

b. a base that may be disposed to rest on said horizontal surface; and

c. means for pivotally supporting said tray on said base to permit said playing compartments to be successively positioned before each player to permit him to draw a card after the hole number has been announced from said course card, the yards therefor, and par therefor, said cards as drawn by said players being laid on said horizontal surface with said second sides up until play for said hole is completed in accordance with a predetermined set of rules selected by said players such as the United States Golf Associated rules, with the laid out cards after the scores for each hole has been determined being returned to said discard compartments, and play continued successively on each of said holes as above described until all of said holes on said course card have been played, with the drawing of each card being equivalent to a stroke if golf was actually played, and the player or group of players having the lowest number of strokes being the winner.

4,289,316

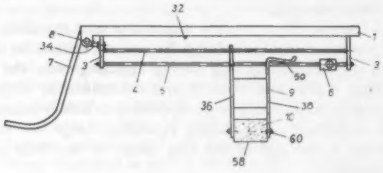
APPARATUS FOR THE CLEANING OF PHONOGRAPH RECORDS

Rudolf Laeng, Friedeggstrasse 9, CH-3400 Burgdorf/Schweiz, Switzerland

Continuation-in-part of Ser. No. 835,435, Sep. 22, 1977, abandoned. This application Apr. 16, 1979, Ser. No. 30,092

Int. Cl.³ G11B *3/58*

U.S. Cl. 369—72 **8 Claims**



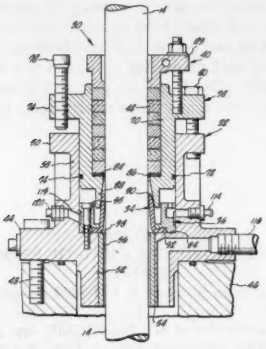
1. Apparatus for automatically selectively cleaning and neutralizing electrostatic charges on phonograph records and adapted to be mounted on a carrier, comprising the combination of: a turntable adapted to receive a phonograph record thereon for operatively turning movement, longitudinal guide means extending above and radially of the phonograph record and proportioned to be of a length at least equal to the radius of the record being played, brush means carried by said guide means and lightly engageable with the surface of the record with a normal force adapted to effect dust and dirt removal without substantial impeding effort to free rotation of the phonograph record, depending support arms slopingly extending from said guide means for carrying said brush means, connecting means forming a relatively freely slideable connection between said support arms and said guide means to permit radially traversing movement of said brush means across the surface of the record responsively of the rotation of the record, said brush means being radially movable by the record grooves whereby said brush means traverses the record in a radial sense to effect dust removal and electrostatic charge neutralization of the record, said carrier comprising a dust cover pivotably attached at one edge to the turntable chasses and swingable to an open position for changing records, said radially disposed guide means being attached to and depending from the inner surface of said dust cover, the outer end of said guide means being adjacent said one edge so that upon swinging said cover to an open position, said brush means will slide downwardly on said guide means to automatically reposition the brush means toward the outer end of said guide means, and movable record wiper means pivotally carried by said carrier and extending radially inward to said carrier, said wiper means being in engagement with the pintil of the turntable to ground charges picked up from the record during play thereof.

4,289,317

PUMP SHAFT CLOSURE

Henry Kuc, Los Angeles, Calif., assignor to Peerless Pump Division, Indian Head, Inc., Montebello, Calif.

Filed Jul. 25, 1979, Ser. No. 60,795
Int. Cl.³ F16J *15/18*; F16K *1/00*
U.S. Cl. 277—1 **11 Claims**



11. A method for removing the packing from a stuffing box assembly for a rotatable shaft used to drive a fluid pump, the assembly comprising:

(a) a housing concentrically disposed around the shaft;

(b) packing means for holding the packing against the shaft;

(c) a resilient sealing ring having opposing ends, the ring being within said housing and concentrically disposed around the shaft, the ring comprising an axially extending main portion and a radially extending flange, the flange being at the end of the ring closer to the fluid being pumped;

(d) retaining means for securely holding the flange against the housing so that in the absence of a radially inwardly directed force the main portion of the sealing ring is radially spaced apart from the shaft so that fluid can pass axially along the shaft and act to force the sealing ring radially away from the shaft;

(e) a seal container secured to the housing and axially movable relative to the housing, the shaft, and the sealing ring; and

(f) means for controllably displacing the seal container axially relative to the shaft for selectively (i) pressing the main portion of the sealing ring radially inwardly against the shaft for forming a static seal around the shaft or (ii) allowing the sealing ring to be spaced apart from the shaft, the method comprising the steps of stopping rotation of the shaft, displacing the container axially relative to the shaft to press the main portion of the sealing ring radially inwardly against the shaft, thereby forming a static seal around the shaft, and removing the packing.

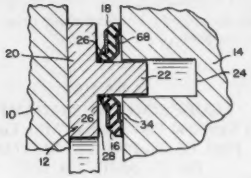
4,289,318

HYDRAULIC MOTOR BALANCING RING SEAL

Douglas A. Cather, Jr., and Martin E. Benjamin, both of Gastonia, N.C., assignors to Garlock Inc., Longview, Tex.

Filed Mar. 24, 1980, Ser. No. 133,539
Int. Cl.³ F16J *15/32, 15/34*
U.S. Cl. 277—12 **48 Claims**

1. An annular elastomeric sealing ring comprising a unitary elastomeric body including a flat, radially extending central ring, a pair of sealing elements projecting axially away from opposite ends of said central ring and in opposite axial directions therefrom, said sealing elements each tapering to a sealing lip in the direction axially away from said central ring, and at least one of said sealing elements and the adjacent radial end of



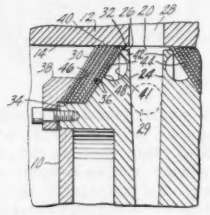
said central ring having a coextensive cylindrical surface forming one of the I.D. or the O.D. surfaces of of said sealing ring.

4,289,319

ROTARY SEAL CONSTRUCTION AND PROCESSOR

Peter Hold, Milford, Conn., and Zehev Tadmor, Teaneck, N.J., assignors to USM Corporation, Farmington, Conn.

Filed Aug. 22, 1978, Ser. No. 935,782
Int. Cl.³ B01F *7/10*; F16J *15/26, 15/48*
U.S. Cl. 277—59 **11 Claims**



1. In a machine for processing plastic and polymeric materials which are, or become in the course of processing, viscous liquids comprising:

A. a rotatable element comprising a rotor carrying at least one channel including opposed side walls;

B. a stationary element providing a coaxial surface cooperatively arranged with said channel to provide an enclosed processing passage;

C. means including an inlet opening to feed polymeric or plastic material to said passage;

D. means for causing relative rotation between said channel and said coaxial surface about their common axis to move said side walls in a circumferential direction from the inlet opening of said passage;

E. an outlet opening from said passage circumferentially disposed a major portion of a complete revolution from said inlet opening in the direction of rotation of said channel; and

F. a blocking member comprising an end wall and scraper portions disposed in said passage between said outlet opening and said inlet opening in the direction of rotation of said channel so that material in contact with said walls is dragged forward against said blocking member in said channel for processing and discharge;

the improvement which comprises a seal structure arranged on at least one side of said channel, said structure including a plurality of annular conical members of thin, stiffly resilient sheet material of narrow width disposed between said channel and said coaxial surface, the sheet material of said annular member extending at an angle to said coaxial surface whereby each 360° of annular member is substantially a truncated cone and the cones of the plurality of annular members are in nested relation with inner edge

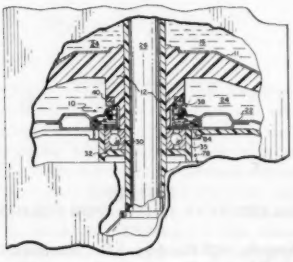
portions of said annular members adjacent and in position to resist flow from said channel and outer edge portions adjacent to said coaxial surface member, and means for fixing said seal structures to said rotor and for acting on the annular member of each structure farthest from said channel to hold inner edge portions of said annular member farthest from said channel against being displaced by pressure from said channel and to maintain said annular members in a sealing relation with said coaxial surface and said channel with said outer edge portions adjacent said coaxial surface being free and displaceable by pressure.

4,289,320

FACE SEAL FOR WASHER TUB AND WATER PUMP

Ronald L. Altnau, Ripon, Wis., assignor to Speed Queen Company, Ripon, Wis.

Filed Jan. 22, 1980, Ser. No. 114,271
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—67 **1 Claim**



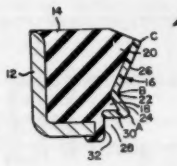
1. A face seal assembly for use with liquid retaining apparatus including a stationary lower component and a rotatable upper component rotatably mounted above said lower component, a central drive shaft extending through said lower component, bearing means surrounding said drive shaft between said shaft and said lower component for accommodating rotation of the shaft relative to the stationary lower component, a support engaging said upper component with said shaft for rotation of the upper component therewith relative to said lower component, a first annular seal, a collar surrounding said drive shaft and receiving and mounting said seal on said support in surrounding relation to said drive shaft and upwardly spaced from said bearing mean, said collar including an annular ring defining upper and lower surfaces and inner and outer annular edges, a rim integral with and depending from said inner edge peripherally thereabout, said first seal seating against the lower surface of said annular ring and against said rim, said first seal presenting a downwardly directed seal surface, said rim depending below said seal surface and terminating in an annular lower edge, a second annular seal positioned below said first seal, said second seal including an upwardly directed seal surface engaged against the seal surface of said first seal in outwardly spaced relation to said rim and in spaced relation above the lower edge of said rim, a retainer member comprising an annular base overlying said bearing means and underlying said second seal in spaced relation therebelow, said base defining an inner annular edge and an outer annular edge, a peripheral wall integral with the inner edge of the base and projecting vertically therefrom radially inward of the depending rim, said peripheral wall terminating in an upper annular edge in spaced relation above the lower edge of the rim, said annular base extending radially outward of said bearing means, and liquid draining apertures defined through said base outward of said bearing means, a resilient bellows including a lower annular lip engaged with the outer annular edge of the annular base, said bellows including an upper annular collar portion defining an annular seat receiving said second seal, and a spring positioned within said bellows and engaged between said annular base and said second seal seating collar portion for resiliently biasing said second seal against said first seal.

4,289,321

PRESSURE SHAFT SEAL AND METHOD

Douglas A. Cather, Jr., Gastonia, N.C., assignor to Garlock Inc, Longview, Tex.

Filed Feb. 27, 1979, Ser. No. 15,597
Int. Cl.³ F16J *15/32*
U.S. Cl. 277—152 **14 Claims**



1. A bearing seal for rotary drill bits for preventing excess pressure buildup in a bearing by purging bearing lubricant when its pressure rises above a particular value and for excluding drilling mud from the bearing comprising:

(a) an annular metal shell;

(b) an annular elastomeric body bonded to said shell;

(c) a polytetrafluorethylene liner bonded to an I.D. surface of said elastomeric body;

(d) said seal including a first, axially inner, reversible, lubricant sealing lip and a second axially outer mud sealing lip, both of said lips being located axially within the axial ends of said shell and both of said lips being backed up by a continuous quantity of said elastomeric body located between said lips and said shell, both of said sealing lips being V-shaped in partial cross-section, said first sealing lip having a sufficient radial length with respect to its axial width at its base such that it can move, relative to the elastomeric material located between it and said shell, and reverse its direction from extending axially inwardly to extending axially outwardly; said first lip having an axial length shorter than that of said second lip;

(e) said lips having first and second loading zones respectively, said first zone being adapted to control the pressure at which said seal can open up and purge lubricant to prevent lubricant pressure build up and said second zone being adapted to exclude drilling mud and to act as a restriction to control lubricant loss after purging has begun;

(f) said liner providing first and second sealing surfaces for said first and second lips, respectively, and said liner in its as-molded configuration having an inverted V-shape in partial cross-section, with said first sealing surface being a first leg of said V and said second sealing surface being a second leg of said V, said first and second lips meeting at an annular hinge line of said liner, said first sealing surface being straight and tapering from said hinge line radially and axially inwardly and said second sealing surface being straight and tapering radially inwardly and axially outwardly, said second lip extending radially inwardly from said hinge line about twice as far as said first lip; and

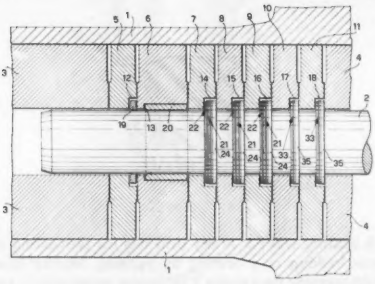
(g) said elastomeric body having an annular recess axially inwardly of said first lip and defined by first and second recess surfaces, said first recess surface extending radially outwardly from said first lip and said second recess surface extending axially inwardly from the radially outer end of said first recess surface, whereby lubricant pressure in said recess can cause said first lip to reverse its direction and move from an axially inwardly extending direction to an axially outwardly extending direction providing an obtuse angle between said first and second recess surfaces and allowing lubricant to be purged from said seal.

4,289,322

GLAND PACK FOR RECIPROCATING MACHINES OPERATING AT HIGH PRESSURE

Alessandro Traversari, and Enzo Giacomelli, both of Florence, Italy, assignors to Nuovo Pignone S.p.A., Florence, Italy

Filed Apr. 25, 1980, Ser. No. 144,174
Claims priority, application Italy, Sep. 25, 1979, 26005 A/79
Int. Cl.[3] F16J *15/28, 15/48*
U.S. Cl. 277—188 A **13 Claims**



1. A gland pack for reciprocating machines operating at high pressure, constituted by a number of cylindrical gland boxes disposed adjoining each other concentric to the machine plunger and extending axially along said plunger from the head end to the crank mechanism end of said machine, said gland boxes each comprising a flat sided cavity concentric to the plunger and open towards it, in the first cavity or cavities at the head end there being housed a pressure breaking ring or rings, whereas in each of the subsequent cavities there is housed a seal assembly arranged to press a seal element against the plunger by the effect of the pressure difference between its exterior and interior, wherein said seal assembly is constituted by three flat sided rings adjoining each other along their adjacent flat sides, of which the central ring, enclosed coaxially between a first and a second metal anti-extrusion ring and constituting the seal element, is constructed of self-lubricating plastics material and is composed of a number of pseudotangentially cut segments held together by a circumferential spring, and said first metal anti-extrusion ring situated at the head end of the cavity comprises radial grooves in its flat surface on the head side, the said two first and second metal anti-extrusion rings being sized such that there is a small radial gap between them and the plunger traversing their bore, and such as to deform elastically by reducing their diameter when subjected to a differential pressure between their exterior and interior, and thus approach the surface of the plunger but without ever pressing against it.

4,289,323

WHEEL IMPROVEMENT FOR ROLLER SKATES

Marvin Roberts, 7645 Densmore Ave., Van Nuys, Calif. 91406

Filed Aug. 10, 1979, Ser. No. 65,536
Int. Cl.[3] A63C *17/14*
U.S. Cl. 280—11.21 **4 Claims**

1. In a roller skate having a support plate and downwardly depending trucks holding a front and a rear axle rollably mounting wheels on the opposite ends thereof, the combination comprising:

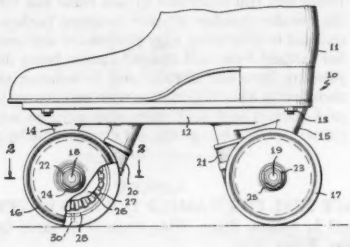
a rotor fixed to the inside surface of a wheel;

a stator carried on said truck having a surface in close proximity to said rotor;

a cage having a plurality of bearings thereon rollably engagable with said rotor and said stator surface;

means cooperatively disposed on said rotor and said stator for selectively inhibiting rotation of said wheel in a given direction;

adjusting means operably carried on said truck for urging said stator surface into engagement with said bearings;



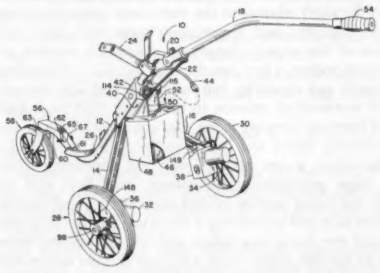
said adjusting means including a thrust plate having a manually operated arm thereon for moving said stator towards and away from said caged bearings.

4,289,324

FOLDING TRICYCLE WHEEL FOR FOLDING GOLF CART

Edwin A. Nemeth, 1620 Beechwood Dr., Martinez, Calif. 94553, assignor to Edwin A. Nemeth, Pittsburg, Calif.

Division of Ser. No. 911,640, Jun. 1, 1978, Pat. No. 4,252,870, which is a division of Ser. No. 717,780, Aug. 25, 1976, Pat. No. 4,106,583. This application Oct. 4, 1979, Ser. No. 81,977
Int. Cl.[3] B62B *3/02*
U.S. Cl. 280—38 **4 Claims**



1. A golf club carrying cart comprising:

a collapsible frame for supporting a golf bag in an inclined position, first and second spaced apart wheels which are parallel in all positions, the frame including a main column defining an upwardly arching segment adjacent the lower end of the golf bag supporting portion of said frame; and

a pivotal third wheel means including a support arm, a caster wheel, and means for pivotally attaching said third wheel means to said support arm, wherein said support arm is telescopically attachable to said upwardly arching segment and flexible in a first down position forming in combination with said first and second spaced wheels a tricycle support, said third wheel means being further fixable in a second up position, such that in said up position said caster wheel is conformable to said upwardly arching main column segment.

4,289,325

SKATEBOARD

Robert J. Whitacre, 13231 42 NE., Seattle, Wash. 98125

Continuation of Ser. No. 830,392, Sep. 6, 1977, abandoned, which is a continuation of Ser. No. 953,858, Oct. 23, 1978, abandoned. This application Dec. 18, 1979, Ser. No. 104,891

Int. Cl.[3] A63C *17/02*

U.S. Cl. 280—87.04 A 3 Claims

1. A skateboard comprising a central platform section; a skate wheel unit carried by and disposed under each end portion of said central section; a forward extension carried by and extending forwardly of said central section; connecting means for adjustably connecting with the forward extension and at selected portions of the length of such extension, said adjusting means comprising a plurality of longitudinally spaced openings in the forward extension; and a support rope connected with said connecting means, said support rope being connectable with a selected opening of said spaced openings in said forward extension to provide an angular relation of about 60° of the support rope to the central section, when the rope is gripped by a rider standing on the central section and with the rider's rope-engaging arm alined with the support rope, thereby providing enhancement of rider control of the skateboard and maintaining a certain angular relation of rope to rider with riders of varying heights.

4,289,326

COLLAPSIBLE TRIPODS

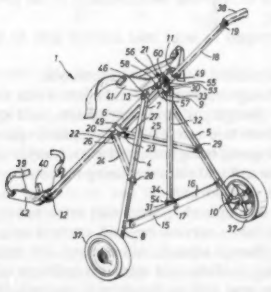
Peter C. Hawkes, Rugby, England, assignor to Andrews MacLaren Limited, Long Buckby, England

Filed Aug. 27, 1979, Ser. No. 70,118

Claims priority, application United Kingdom, Aug. 25, 1978, 34695/78

Int. Cl.[3] B62D *3/04*

U.S. Cl. 280—646 8 Claims



1. A collapsible tripod (1, 2 or 3) comprising:

first, second and third elongate legs (4, 5 and 6) which each have a head end and a foot end (7 and 8, 9 and 10, and 11 and 12);

first and second upper pivot members (13 and 14) respectively supported on the third leg (6), adjacent the head end (11) of the third leg (6), and respectively engaging the head ends (7 and 9) of the first and second legs (4 and 5) for pivotal movement of the first and second legs (4 and 5) between a first configuration, corresponding to an extended condition of the tripod (1, 2 or 3), in which the first, second and third legs (4, 5 and 6) mutually diverge from their head ends (7, 9 and 11) and their foot ends (8, 10 and 12) are disposed at the vertices of an imaginary triangle, and a second configuration, corresponding to a collapsed condition of the tripod (1, 2 or 3), in which the first and second legs (4 and 5) lie alongside the third leg (6);

first and second bracing links (15 and 16) respectively pivoted to the first and second legs (4 and 5); and

a first single pivot member (17) interconnecting the bracing links (15 and 16);

characterised in that:

an elongate actuating member (18), having a head end (19) and a foot end (20), is connected to the third leg (6) for movement relative to the third leg (6) between first and second positions in which the foot end (20) of the actuating member (18) is closer to and further from the head end (11) of the third leg (6);

locking means (21) are provided for releasably securing the actuating member (18) in its first position, relative to the third leg (6);

first and second lower pivot members (22 and 23) are supported on the actuating member (18), adjacent the foot end (20) of the actuating member (18);

first and second tie members (24 and 25) have head ends (26 and 27) respectively engaging the first and second lower pivot members (22 and 23) and have foot ends (28 and 29) respectively pivoted to the first and second legs (4 and 5);

a second single pivot member (30) is attached to the actuating member (18) and has a pivotal axis extending transversely of the actuating member (18);

a third single pivot member (31) is supported by the first single pivot member (17); and

a control link (32) has head and foot ends (33 and 34) respectively connected to the second and third single pivot members (30 and 31) so as to move the first single pivot member (17) between first and second positions respectively closer to and further from the head ends (7 and 9) of the first and second legs (4 and 5) during pivotal movement of the first and second legs (4 and 5) between their first and second configurations and during pivotal movement of the foot end (34) of the control link (32) about an axis extending perpendicular to the first single pivot member (17) and parallel to the pivotal axis of the second single pivot member (30), and so as to hold the first single pivot member (17) in its first position when the first and second legs (4 and 5) are in their first configuration and the tripod (1, 2 or 3) is in its extended condition, to thereby brace the first and second legs (4 and 5) relative to each other.

4,289,327

AIR BAG DEVICE FOR CARS

Motohiro Okada, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 854,337, Nov. 23, 1977, Pat. No. 4,203,616. This application Jul. 6, 1979, Ser. No. 55,458

Claims priority, application Japan, Feb. 8, 1977, 52/12882

Int. Cl.[3] B60R *21/08*

U.S. Cl. 280—737 6 Claims

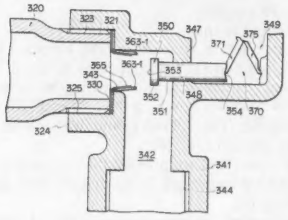
1. An air bag device, comprising:

a container for being charged with a gas under pressure;

said gas container including an opening portion communicating with an air bag;

a pressing lid;

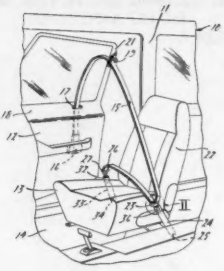
a frangible lid disposed between said pressing lid and said gas container;
said opening portion of said gas container being tightly sealed by said frangible lid;
said pressing lid being provided in an inlet portion of a passage connecting said opening portion of said container with an inlet of the air bag;
said pressing lid including a body portion having an outside diameter substantially smaller than the diameter of said inlet portion of said passage, such that the outer periphery of said body portion is substantially spaced apart inwardly from said inlet portion so as to define a definite annular space between said body portion of said pressing lid and said inlet portion of said passage;
said frangible lid being disposed so as to face said inlet portion of said passage and being supported on only a central part of one surface thereof by said body portion of said pressing lid;



said frangible lid having an outer peripheral part facing said annular space around said body portion of said pressing lid;
said body portion of said pressing lid being provided with a pressing surface contacting only said central part of said frangible lid which is sufficiently large to prevent fracture of said frangible lid by said gas under pressure only when the pressure of said gas is within a normal range;
said outer peripheral part of said frangible lid being partially fracturable when the pressure of said gas becomes abnormally high so as to permit gradual discharge of the high pressure gas through said annular space, with said central part of said frangible lid remaining supported by said body portion of said pressing lid;
means for applying pressure to said pressing lid; and
impact detecting means for releasing said link mechanism.

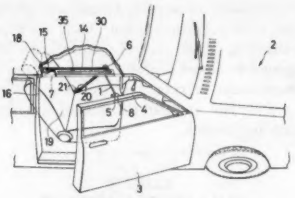
4,289,328
SEAT BELT SYSTEM
John R. Repp, Dearborn, and Donald H. Smith, Trenton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 4, 1978, Ser. No. 966,236
Int. Cl.[3] B60R *21/02*
U.S. Cl. 280—803 **2 Claims**

1. A vehicle seat belt system having an upper passive and a lower active seat occupant restraint means, comprising:
a belt retractor mechanism mounted within a vehicle door adjacent one side of the vehicle seat,
a continuous seat belt extending from the retractor mechanism through a first guide ring mounted above the retractor mechanism on a frame member of the door, and further, in door closed position, extending diagonally across the seat occupant's body and freely slidable through a second guide ring anchored to a vehicle floor mounted attachment means on the other side of the seat,
the terminal end of the seat belt carrying a buckle tongue constructed and arranged to coact with the second guide ring to prevent disengagement of the terminal end of the seat belt from the second guide ring and thereby maintaining the seat belt in its diagonally extending occupant restraint position under all operating conditions,
the seat belt diagonally extending portion automatically fitting itself across the upper body portion of the seat occupant upon the door being closed thereby providing an upper passive restraint means,
and buckle means attached to the vehicle on the one side of



the seat to which the buckle tongue may be manually coupled upon the seat occupant further extending the seat belt across his lap thereby providing in addition to the upper passive restraint means a lower active restraint means.

4,289,329
SEAT BELT SYSTEM
Keiichiro Yabuta, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed May 24, 1979, Ser. No. 42,371
Claims priority, application Japan, May 27, 1978, 53-63748
Int. Cl.[3] B60R *21/10*
U.S. Cl. 280—804 **4 Claims**



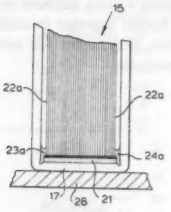
1. In an automobile including a seat, a forwardly hinged door including an upper sash portion and a roof side adjacent the upper sash portion
a seat belt system comprising:
a control arm mounted to the upper sash portion of the door for swinging movement and having a portion slidably mounted to slide along the roof side longitudinally of the automobile in response to movement of the door about its hinge axis;
a spring arranged to urge said control arm to swing rearward;
a retractor mounted within the automobile;
said spring being coupled with said control arm to effect said rearward swinging of said control arm, said spring being separate from said retractor and disposed spacedly therefrom, said spring being mounted at said upper sash portion of the door and said retractor being mounted other than at said upper sash portion;
a safety seat belt extending from said retractor and having a portion slidably carried by said control arm such that when the door is closed, said control arm extends along the roof side to allow said retractor to fasten said seat belt around the seat and as the door is opened, the opening movement of the door about its hinge causing said control arm to swing, thus extending said seat belt forwardly of the seat.

4,289,330

BOOKBINDING SYSTEM

Jerome J. Wiermanski, Wayne, Ill., assignor to General Binding Corporation, Northbrook, Ill.

Filed Oct. 10, 1979, Ser. No. 83,232
Int. Cl.[3] B42D *1/04*
U.S. Cl. 281—21 R 8 Claims



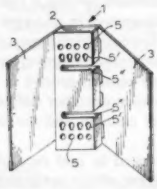
1. A book cover structure of the type having a spine with front and back covers connected to the spine and separated from the spine by scribes to enable the front and back covers to flex relative to the spine, the improvement comprising a spine strip of hot melt adhesive being secured on an inside face area of said spine, and spacer means for holding sheets in engagement with said spine strip spaced outwardly of said scribes comprising a pair of cover strips of hot melt adhesive secured to inside surface areas of the front and back covers in spaced adjacency to the scribes with the scribes separating the hot melt adhesive strips on the covers from the strip of hot melt adhesive on the spine.

4,289,331

COMPILER-BINDER FOR PERIODICALS AND THE LIKE

Alexander E. Finger, and Fay Finger, both of 52 County Rd., Chelsea, Mass. 02150

Filed Jul. 2, 1979, Ser. No. 54,163
Int. Cl.[3] B42D *1/06*; B42F *13/00, 1/00*
U.S. Cl. 281—47 10 Claims



1. A compiler-binder for periodicals and the like comprising a rigid back spine and covers hinged thereto, spaced opening means formed in said rigid spine in spaced relation to the opposite ends of the spine, the opening means comprising at least a pair of holes extending in the thickness direction of the spine for receiving projections, clip means securable to the back of said periodicals and the like to be bound within the covers and having a pair of rearwardly protruding integral projections spaced for reception within the opening means, and cooperative means provided on the opening means and the projections, for locking said periodicals against movement lengthwise and in the thickness direction of the spine when the latter are inserted in the opening means, whereby the spine facilitates the binding of periodicals simulating a rigidly bound book.

4,289,332

RECORDING SHEET

Hajime Kato, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 9, 1979, Ser. No. 65,017
Claims priority, application Japan, Aug. 9, 1978, 53-96937
Int. Cl.[3] B41M *5/16, 5/22*
U.S. Cl. 282—27.5 15 Claims

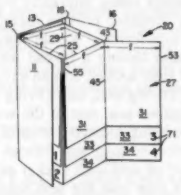
1. A recording sheet capable of forming color when brought into contact with an electron donating color former, which comprises a support having coated thereon a layer prepared from a coating composition comprising a polyvalent metal salt of an aromatic carboxylic acid, a montmorillonite clay mineral containing about 10 to 20 parts by weight of aluminum per 100 parts by weight of silicon, zinc oxide, and a binder and which contains about 30 to 60 wt% solid ingredients and has a viscosity of about 50 to 7,000 cps.

4,289,333

METHOD FOR LOCATING FEATURES ON A MAP

Ralph R. Gaetano, Bethel Park, Pa., assignor to Think, Inc., Morgantown, W. Va.

Division of Ser. No. 967,517, Dec. 7, 1978. This application Jun. 28, 1979, Ser. No. 52,859
Int. Cl.[3] G09B *29/04, 29/10*
U.S. Cl. 283—35 3 Claims



1. A sequential concentration system for locating a feature on a map, comprising:

A. a coding system which comprises:

(1) a pagination system, comprising:

(a) pages containing large areas within which are the locations of a plurality of features, including said feature to be located, and

(b) page indicators which correspond to said pages and are printed thereon,

(2) a section system, comprising:

(a) a plurality of sections into which said pages are subdivided, and

(b) overprinted section indicators within said sections, and

(3) a subsection system, comprising:

(a) a plurality of subsections into which said sections are subdivided, and

(b) overprinted subsection indicators which are printed within said subsections;

B. a directory which comprises:

(1) a feature column listing said features,

(2) a page column listing said page indicators corresponding to the locations of said features within said pages;

(3) a section column listing said section indicators corresponding to the locations of said features within said section, and

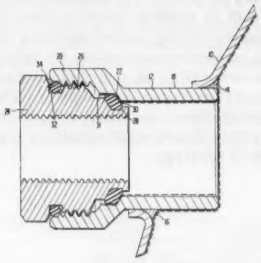
(4) a subsection column listing said subsection indicators corresponding to the locations of said features within said subsections.

4,289,334

SOCKET CONNECTION FOR AN ENAMELLED VESSEL

Harry J. Riley, Wembley, Australia, assignor to S. W. Hart & Co. Pty. Ltd., Welshpool, Australia

Filed Nov. 28, 1979, Ser. No. 98,417
Claims priority, application Japan, Sep. 6, 1979, 54/114693
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—55 **3 Claims**



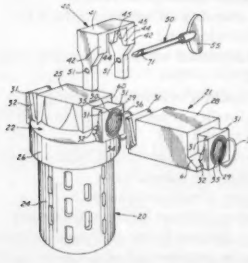
1. An internally enamelled steel vessel having a steel socket welded thereto, wherein said steel socket comprises
(a) a parallel portion adjacent said vessel;
(b) an internally threaded portion remote from said vessel; and
(c) a seat located between said parallel and threaded portions;
(d) said steel socket being internally enamelled except for said internally threaded portion thereof;
(e) a further, non-ferrous socket having an externally threaded portion having a thread matching the internal thread of said steel socket, and an external O-ring groove containing an O-ring seal, said O-ring seal being sealingly compressed against said seat in the said steel socket, said O-ring groove being located forwardly of said externally threaded portion of said non-ferrous socket so that the internal enamel of said steel socket extends outwardly of said O-ring groove and the seal formed by said O-ring seal.

4,289,335

MODULAR CLAMPING SYSTEM FOR PRESSURE FLUID COMPONENTS

Joseph M. Olbermann, Denver, Colo., assignor to Wilkerson Corporation, Englewood, Colo.

Filed Jan. 11, 1980, Ser. No. 111,350
Int. Cl.³ F16L *15/00*
U.S. Cl. 285—91 **7 Claims**



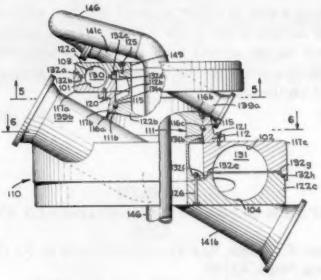
1. A clamping structure for releasably securing together two pressure fluid conducting components in sealed relationship, comprising, in combination, means on each component defining a sealing surface including a pressure fluid port therein and adapted for juxtaposed sealing engagement with a corresponding sealing surface on the other component, transversely extending flanges adjacent each of said sealing surfaces and defining on each component coplanar cam surfaces sloping away from the adjacent sealing surface, a U-shaped yoke having spaced parallel depending legs for straddling three sides of said components, means on each of said legs defining a pair of opposed sloping cam surfaces engageable with said flanges when said component sealing surfaces are positioned together for clamping said bodies together in sealed pressure fluid conducting engagement, and means for releasably securing said yoke to said components.

4,289,336

PIPE SWIVEL JOINT FOR A PLURALITY OF SEPARATE FLUIDS

Etienne Bajeux, Saligny, France, assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 26, 1979, Ser. No. 23,815
Claims priority, application France, Apr. 6, 1978, 78 10218
Int. Cl.³ F16L *39/04*
U.S. Cl. 285—136 **9 Claims**

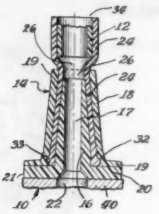


1. A swivel joint for connecting an inlet conduit with an outlet conduit, said joint comprising:
an annular inner element having a radial flange which includes an annular groove in its upper face;
an annular outer element at least partially surrounding said inner element, said outer element having a radial flange which includes an annular groove in its lower face;
an annular bearing race chamber defined by the outer surface of said inner element and the inner surface of said outer element;
bearing means mounted in said race chamber to facilitate rotational movement of said outer element relative to said inner element;
an annular fluid flow passage defined by the annular groove in the upper face of said flange of said inner element and the annular groove in the lower face of said flange of said outer element, the diameter of said flange faces defining said fluid flow passages being larger than the diameter of the inner and outer surfaces defining said bearing race chamber;
means for connecting said inlet conduit to the portion of said flow passage that is defined by the upper face of said flange of said inner element;
means for connecting said outlet conduit with the portion of said flow passage that is defined by the lower face of said flange of said outer element; and
means for sealing the fluid flow passage at the junction of said inner element and said outer element.

4,289,337
TUBING CONNECTION FOR CONTAINERS GENERALLY UTILIZING DISSIMILAR MATERIALS

Frank L. Roe, Ingleside, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 23, 1979, Ser. No. 41,838
Int. Cl.[3] F16L *3/04*
U.S. Cl. 285—158 1 Claim

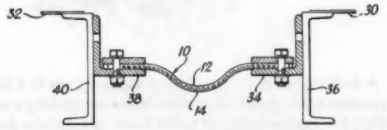


1. A connector between a flexible tube and a container, which comprises: inner and outer telescoping sleeve members, tapered along essentially their entire lengths, each of said sleeve members carrying a flange adapted for sealing about an aperture in said container, said flanges being sealed together, a flexible tubing segment, one end of said tubing segment being positioned in telescoping relation about the inner sleeve member, with said inner member occupying the bore of said flexible tube, said end of the tubing segment being also positioned within the outer tapered telescoping sleeve member, said tubing segment being firmly retained by compression between said telescoping, tapered sleeve members, the direction of tapering of said sleeve members being away from said flanges, said flanges comprising a material which is sealingly compatible with said container, said tubing segment defining a different material from the material of said sleeve members and flanges, said tubing segment also defining an opposite outer end which is telescopically connected with and sealed to a tube extension made of a material which is sealingly compatible with said tubing segment.

4,289,338
BELT TYPE EXPANSION JOINTS

Francis E. Cook, Downers Grove, Ill., assignor to Dearborn Rubber Company, Westmont, Ill.

Division of Ser. No. 922,561, Jul. 7, 1978, Pat. No. 4,250,223.
This application Jul. 7, 1980, Ser. No. 165,967
Int. Cl.[3] F16L *27/10, 51/02*
U.S. Cl. 285—229 10 Claims



1. Apparatus for conducting hot or chemically active material comprising:

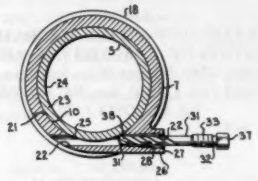
a pair of adjacent ducts having a space therebetween;

a duct connector secured to said adjacent ducts and disposed across said space between said adjacent ducts, said connector comprising a heat shield comprising a layer of metal foil secured to a layer of polyester disposed directly under said metal foil layer, said heat shield being secured to a layer of heat-stable elastomer having a heat insulating fabric embedded therein and said heat shield being vulcanized to said elastomer layer while said elastomer is in contact with said heat shield.

4,289,339
FITTING WITH TANGENTIAL LOCKING ROD FOR COUPLING PIPES

Arne H. Hansen, Doylestown, Pa., assignor to Meyertech Incorporated, Lakewood, Colo.

Filed Nov. 28, 1979, Ser. No. 98,067
Int. Cl.[3] F16L *21/08*
U.S. Cl. 285—305 9 Claims



1. A pipe fitting comprising:

(a) a body having a wall defining a pipe end receiving socket with a pipe cradling interior surface;

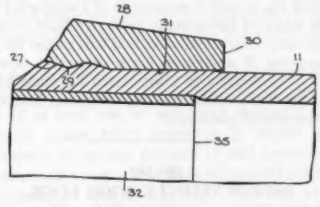
(b) a bore extending substantially tangentially through said wall and communicating with said interior surface over less than a cross-sectional circular periphery of said bore whereupon a segment of the wall of said bore forms an intersection with said interior surface along the length of said bore; and

(c) a rotatable, cylindrical locking rod received in said bore and having a material removing, cutting tip for tangentially cutting a smooth-bored, continuous groove along said intersection in a pipe received in said socket and filling said groove to prevent removal of said pipe, said locking rod having engagement means thereon cooperating with said bore to retain said locking rod received in said bore.

4,289,340
MECHANICALLY ATTACHED END FITTING WITH INSERT FOR METAL TUBING

Irving D. Press, West Orange, and Harvey R. Nickerson, Roseland, both of N.J., assignors to Resistoflex Corporation, Roseland, N.J.

Filed Dec. 28, 1978, Ser. No. 974,068
Int. Cl.[3] F16L *13/14*
U.S. Cl. 285—382.4 9 Claims



1. A fitting for attachment to an end of a thin walled metal tube, said fitting comprising a hard, metal body portion having a bore which can be entered for a given distance with a sliding fit from one end by the end of a metal tube, said bore having its sidewall within said given distance formed with a plurality of axially spaced circumferential grooves separated from each other and from said one end of the bore by a corresponding contiguous cylindrical land section each of finite axial length, said land sections having substantially the same inside diameter, and a hard metal tubular insert having at least a longitudinally extending portion of substantially uniform thickness throughout its length for insertion into said end of said metal

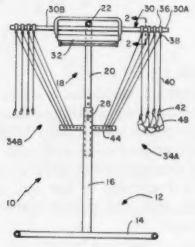
tube, said portion of said insert having a length, outside diameter and construction such that it extends axially from said end of said metal tube, when inserted in the latter and assembled to the body portion, into said metal tube with a snug fit to a point beyond that one of said grooves which is closest to said one end of the bore, and being formed of metal having sufficient malleability to permit radial expansion of at least a portion thereof.

4,289,341

APPARATUS FOR SUPPORTING MACRAME DURING FORMATION OF A PARTICULAR ARTICLE

Floyd H. Sumpter, 1766 Trudean Way, San Jose, Calif. 95132

Filed Feb. 1, 1980, Ser. No. 117,503
Int. Cl.³ D03J *3/00*
U.S. Cl. 289—16.5 **8 Claims**



1. An apparatus for supporting macrame during formation of a particular article from the supported macrame, said apparatus comprising:

(a) means including an upwardly extending support post mounted for vertical movement between different adjustably fixed positions;

(b) a horizontally extending cross-bar connected with and extending on opposite sides of said support post for vertical movement therewith, whereby to adjust the height of said cross-bar from the floor; and

(c) first and second groups of hook arrangements respectively connected with first and secod sections of said cross-bar on opposite sides of said support post and including associated hooks for engaging said macrame and suspending the latter from said cross-bar sections, each of said hook arrangements in each of said groups also including first means for individually moving its associated hook horizontally along its connected cross-bar section, whereby the points of suspension of a supported macrame can be adjusted horizontally relative to said cross-bar and second means independent of said first means for individually moving its associated hook vertically, whereby the points of suspension of a supported macrame can be adjusted vertically relative to said cross-bar, independent of their horizontal positions.

4,289,342

MOTOR VEHICLE DOOR LOCK

Wulf W. Bemm, Cologne, and Günter Weber, Wuppertal, both of Fed. Rep. of Germany, assignors to Neiman S.A., Courbevoie, France

Filed Oct. 16, 1979, Ser. No. 85,360
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1978, 2846550
Int. Cl.³ E05C *3/12*
U.S. Cl. 292—49 **36 Claims**

1. A motor vehicle door lock comprising:

(a) a catch for attachment to the vehicle door frame,

(b) a pivoted locking lever for mounting on the door of said vehicle, said locking lever being movable between an engagement position and a disengaged position,

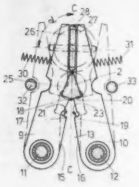
(c) two teeth on said locking lever provided one behind the other in the direction of relative movement between said catch and locking lever, said teeth being shaped to cooperate with said catch,

(d) a spring urging said locking lever into a locking position,

(e) a shaft which when the lock is mounted on the vehicle passes through the vehicle door wall,

(f) door lock operating means,

(g) transmission levers between said door lock operating means and said shaft,



(h) a driving member secured to said shaft, which upon actuation effects a pivotal movement of said locking lever into an unlocked position against the action of the spring, whereby relative movement between the catch and the locking lever to the disengaged position can take place, and

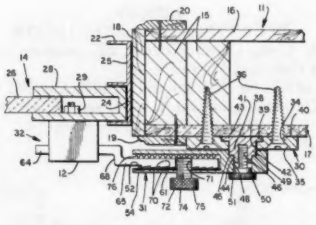
(i) a spring which urges the driving member into a position in which the driving member is in a rest position in which the locking lever is not operated.

4,289,343

LOCK FOR SLIDABLE DOOR

Connie H. Dukes, 4122 Herschell Rd., Apt. A-6, College Park, Ga. 30337

Filed Sep. 20, 1979, Ser. No. 77,482
Int. Cl.³ E05C *19/00*
U.S. Cl. 292—117 **7 Claims**



1. A lock assembly for fastening a slidable door in a stationary position with respect to its door frame comprising a mounting plate for rigid attachment to the frame of a slidable door, an elongated socket connector pivotally mounted to said mounting plate for extending from said mounting plate toward the handle of the slidable door, said socket connector including an opening extending from one end of said socket connector inwardly into said socket connector, a locking element comprising a door handle engagement portion and a tongue extending therefrom, said door handle engagement portion comprising means for connection to the handle of a door, said tongue being sized and shaped to be received in the opening of said socket connector, and means for releasably connecting together said socket connector and said tongue whereby the door handle is fastened in a fixed relationship with respect to the door frame.

4,289,344

RAKES

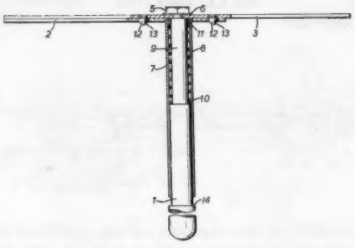
Peter J. D. Mitchell, 60 Betham Rd., Greenford, Middlesex, England

Filed Jul. 6, 1979, Ser. No. 55,499

Claims priority, application United Kingdom, Dec. 6, 1978, 47377/78

Int. Cl.³ A01D *7/06*

U.S. Cl. 294—2 **10 Claims**



1. A hand held rake comprising a shaft handle with a head mounted at one end thereof, the head being formed by two head portions which are each provided with tines and which in a working configuration of the head extend in opposite directions substantially perpendicular to the shaft handle, said head portions being mounted on the shaft handle such that they can pivot relative to each other about an axis parallel to the handle to move between said working configuration and a stowage configuration in which the head portions are in overlying relationship with their tines facing in opposite directions, one said head portion being fixedly mounted on the shaft handle and the other said head portion being fast with a sleeve through which the shaft handle extends whereby said axis of pivoting is substantially coincident with the longitudinal axis of the handle.

4,289,345

LUGGAGE COMPARTMENT COVER APPARATUS FOR AN AUTOMOTIVE VEHICLE

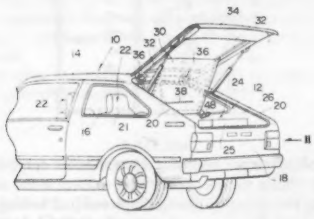
Masahiro Tamamushi, Tokyo, and Kazuo Katakura, Higashikurume, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 4, 1980, Ser. No. 109,643

Claims priority, application Japan, Jan. 16, 1979, 54-4289

Int. Cl.³ B60R *7/04*

U.S. Cl. 296—37.16 **8 Claims**



1. A luggage compartment cover apparatus for closing a luggage compartment of an automotive vehicle which has a rear opening and rear door, both side edges being gradually narrowed in the upward and frontward direction, comprising:

a luggage compartment cover having connecting means pivotably connecting said luggage compartment cover to the vehicle body at the front end thereof, said cover being expandable in the lateral direction and substantially rigid in the longitudinal direction;

a pair of sliders mounted to the rear end of said luggage compartment cover; and

a pair of guide members mounted to respective sides of the automotive vehicle rear door interior so that the lateral spacing between said guide members is narrowed in the upward and frontward direction along the side edge of the door, each of said guide members slidably receiving respective said sliders to allow same to move therealong between a first position in which said luggage compartment cover is expanded to close said luggage compartment, and a second position in which said luggage compartment cover is contracted so as not to interfere with the door opening.

4,289,346

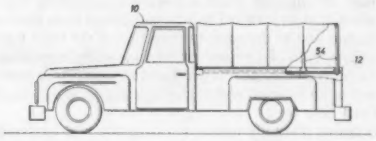
COLLAPSIBLE PROTECTIVE COVER MECHANISM

Norman J. Bourgeois, P.O. Box 1317, Orange, Tex. 77630

Filed Dec. 18, 1978, Ser. No. 970,521

Int. Cl.³ B62D *25/06*

U.S. Cl. 296—105 **16 Claims**



1. A collapsible and extendable telescoping protective cover mechanism for selectively covering and protecting the bed of a vehicle, said protective cover mechanism comprising:

a pair of elongated guide track elements being disposed in spaced generally parallel relation on either side of said area to be protected, each of said guide track elements defining a plurality of guide tracks;

a plurality of cover segments including generally upright and generally parallel side portions interconnected by a top portion, the lower portions of said side portions being received in movable guided relation by said guide track means, one of said cover segments adapted to be releasably secured in immovable relation with said vehicle bed and the other cover segments being movably received by said guide track means and being receivable in telescoping relation with said one cover segment, all of said cover segments being removable from said guide track means as a telescoped cover unit, exposing the entire vehicle bed; and

power actuator means being positioned adjacent each of said guide track means and being interconnected with each side of at least one of said rigid elements, said power actuator means being operative to impart telescoping movement to the side portions of said cover segments to position said cover segments in telescoped position where a majority of said area is uncovered and an extended position where substantially all of said area is covered.

4,289,347

VEHICLE FOLDING TOP

Robert W. Holzwarth, Portage, Mich., assignor to The Model A and Model T Car Reproduction Corporation, Detroit, Mich.

Filed Sep. 4, 1979, Ser. No. 71,926

Int. Cl.³ B60J *7/12*

U.S. Cl. 296—107 **3 Claims**

1. In a folding vehicular top assembly for deployment over a passenger compartment and wherein a flexible cover is supported on a frame comprising:

three pivotally interconnected bows, each having a cover-

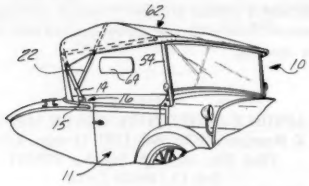
contacting curved joining portion integral with a pair of parallel legs having free ends, said bows including:

a back bow having its free ends secured to the vehicle and projecting upwardly therefrom;

a center bow having its free ends pivoted to the back bow and projecting upwardly and forwardly therefrom;

a front bow having its legs substantially horizontal and broken into two substantially equal lengths hinged together at a pivot;

said center bow having a pivot located on each leg thereof above the front bow legs;



a pair of opposed short rearwardly extending legs each pivoted at its forward end to said center bow pivot and at its rear end to the adjacent rear one of the front bow legs;

a second pair of opposed short forwardly extending legs, each pivoted at its rearward end to said center bow pivot and at its forward end to the adjacent forward one of said front bow legs;

and means pivotally interconnecting the rear extremities of each of said front bow rear legs to the back bow above the pivot connection of the center bow to said back bow; and

means for releasably securing the front bow to the vehicular body.

4,289,348

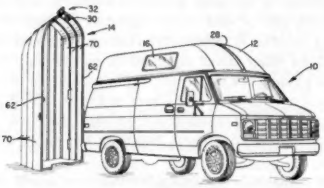
VAN TOP CONVERSION AND BOAT COMBINATION

William C. Greene, 16005 114th Ave., SE., Renton, Wash. 98055

Filed Sep. 18, 1979, Ser. No. 76,667

Int. Cl.[3] B60D *3/10*

U.S. Cl. 296—157 **6 Claims**



1. A vehicle top conversion and boat combination comprising: a top adapted to be permanently installed on a vehicle in a closed, sealed relationship thereto; a boat arranged to be inverted and fitted onto said top in symmetrical relationship therewith; and means for facilitating the loading and unloading of said boat onto and from said top, said boat including a bottom, gunnels, a transom and a bow; said facilitating means comprising means defining a longitudinal, exterior groove along the centerline of said top, a handle and roller assembly pivotally mounted in said bow of said boat and pivotally movable between a first position, latched to a portion of said bow and a second position, latched adjacent said top, said assembly having rollers arranged to ride in said groove when said assembly is in said first position, whereby said boat may be unloaded from said top by grasping said transom and pulling said boat away from said top with said rollers riding in said groove, first latch yoke means mounted at the bow of said boat for releasable engagement with said handle and roller assembly and for retaining said handle and roller assembly in said first position, and second latch yoke means mounted adjacent said top for releasable engagement with said handle and roller assembly and for securing said boat in said second position.

4,289,349

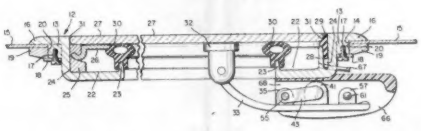
SUNROOF

Ioannis Symeonidis, 375 Virginia Ave., Jersey City, N.J. 07304

Filed Jul. 9, 1979, Ser. No. 55,814

Int. Cl.[3] B60J *7/00*

U.S. Cl. 296—213 **6 Claims**



1. A sunroof for a car comprising a frame, said frame including an open upright channel inside said frame, said channel defined by the wall of said frame and a lip spaced away from the wall of the frame, a first gasket means around the wall of said frame, a second gasket means around the lip, a glass top, said glass top adapted to be hingably mounted within said frame and in contact with said first and second gasket means when in closed position, said glass top further adapted to be substantially in contact with at least said first gasket means along the side of the frame juxtaposed to said hinge whereby air is substantially prevented from passing between said glass top and said first gasket at said side of said frame, and a drain in said frame, said drain from the bottom of said channel through said frame, whereby rain may be carried from said channel when said glass top is in open position.

4,289,350

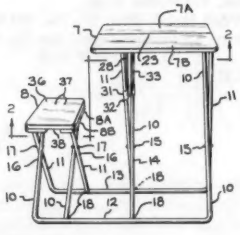
COMBINED FOLDING TABLE AND SEAT

Robert J. Thomas, 3451 Academy, Dearborn, Mich. 48124, and Richard J. Smith, 27005 Michigan Ave., Inkster, Mich. 48141

Filed Nov. 1, 1979, Ser. No. 90,304

Int. Cl.[3] A47B *39/06, 3/02*

U.S. Cl. 297—172 **4 Claims**



1. A folding table and seat combination comprising two elongated tubular members each bent to form in the same plane a base rail, two pairs of parallel legs unequal in length, and a support section between each pair of parallel legs, each such pair of parallel legs having one leg the lower end of which is permanently attached to the base rail, pivotal means connecting together the parallel legs on the two elongated tubular members so that the support sections thereon are disposed opposite each other, a table having two hinged sections pivotally attached to the two oppositely disposed support sections between the two longer pairs of parallel legs, and a seat having two hinged sections pivotally attached to the two oppositely

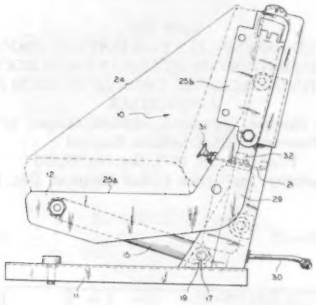
disposed support sections between the two shorter pairs of parallel legs.

4,289,351

LOW PROFILE TRUCK SEAT

Robert J. Wahls, Spring Grove, Ill., assignor to The Freedman Seating Company, Northbrook, Ill.

Filed Oct. 1, 1979, Ser. No. 80,281
Int. Cl.³ B60N *1/06, 1/08*
U.S. Cl. 297—307 **9 Claims**



1. A suspension system for a vehicle seat of the type mounted to the floor of a vehicle, said suspension system cushioning said vehicle seat against shocks and isolating said seat from vibration, said suspension system comprising:

a horizontally extending base plate assembly attached to said floor,

said base plate assembly having front and rear edges;

an upwardly extending back plate,

said back plate integral with said base plate assembly proximate said rear edge of said base plate assembly;

a seat,

said seat including parallel spaced-apart side frame members defining a generally horizontally extending seating surface, and a seat back extending generally upwardly therefrom,

said seat further including means to pivotally link said seat to said base plate assembly,

said link means including at least one link arm extending from said base plate assembly to said seat;

means to cushion said seat from shocks,

said cushioning means including air suspension means to resiliently suspend said seat above said base plate assembly,

said air suspension means having a first end attached to said base plate assembly and a second end attached to said seat,

said air suspension means positioned rearward of said seating surface to situate said seat proximate said base plate assembly; and

said base plate assembly including means to isolate said seat from vibrations and shock.

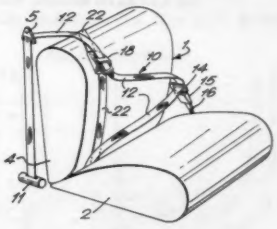
4,289,352

SHOULDER HEIGHT ADJUSTER FOR SEAT BELT SYSTEMS

Roger A. Ashworth, Thursby, England, assignor to Kangol Magnet Limited, Carlisle, England

Filed Feb. 22, 1979, Ser. No. 14,028
Claims priority, application United Kingdom, May 26, 1978, 23047/78
Int. Cl.³ A62B *35/00;* **A47C** *31/00*
U.S. Cl. 297—473 **15 Claims**

1. A safety belt system for restraining an occupant in a vehicle seat having a back portion, the system comprising restraining belt means, said belt means extending in use diagonally across the front of the occupant from an upper first position above the occupant's shoulder at one side of the seat to a second lower position at the other side of the seat, adjustment means including a flexible strap carried by said seat back portion, and connector means slidable along and about said flexible strap and connectible with said belt means at a position thereon between said first position and said shoulder, and means independent of said strap for anchoring both ends of said belt means, whereby said adjustment means serves only to position an intermediate portion of said belt means.

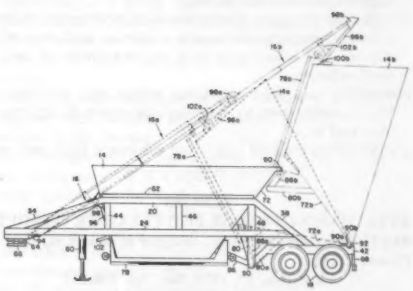


4,289,353

COMBINATION BELLY DUMP/END DUMP VEHICLE

Jackie A. Merritt, P.O. Box 443, Rocksprings, Tex. 78880

Filed May 7, 1979, Ser. No. 36,313
Int. Cl.³ B60P *1/16*
U.S. Cl. 298—17.5 **6 Claims**



1. A combination belly dump/end dump vehicle for hauling material comprising:

a frame mounted upon wheels, said frame containing a first pivot support and a second pivot support, wherein said first pivot support is at least level with or lower than said second pivot support;

a hopper for containing said material, said hopper having gate means located upon a bottom thereof for dumping from a bottom side everything from said hopper and at least one telescopic hydraulic ram for raising a front end of said hopper, said telescopic hydraulic ram being attached to said hopper by hopper lifting means, a lower end of said hopper lifting means being rotatably attached to a front end of said hopper and an upper end of said hopper lifting means being rotatably attached to an upper end of said telescopic hydraulic ram,

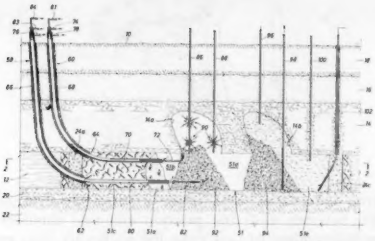
said hopper being located on said frame such that upon raising a front end of said hopper said material dumps out of a rear end of said hopper and over a rear of said frame, said hopper additionally comprising a first pivot means and a second pivot means, wherein said first and second pivot means alternately engage said first and second pivot supports of said frame and at least one of said pivot means engages at least one pivot support at all times during the dumping process.

4,289,354

BOREHOLE MINING OF SOLID MINERAL RESOURCES

Bohdan M. Zakiewicz, Houston, Tex., assignor to Edwin G. Higgins, Jr., Houston, Tex.

Filed Feb. 23, 1979, Ser. No. 14,703
Int. Cl.³ E21C *43/00*
U.S. Cl. 299—4 **19 Claims**



1. A method of mining a solid substance in an underground deposit in one of a plurality of earth strata comprising the steps of:

creating void area in said one earth stratum by emplacing a plurality of explosive charges adjacent one another in said one earth stratum in a plurality of laterally spaced apart loci so as to generally define an area within said deposit to be enclosed, and detonating said charges to create said void areas, said void areas so formed being substantially continuous with one another;

introducing plugging media into said void areas to form a relatively impervious barrier enclosing said area of said deposit and isolating it from the remainder of said one earth stratum;

converting said solid substance within said enclosed area into flowable form by injecting conversion media into said enclosed area;

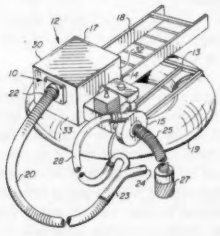
and withdrawing said converted substance from said area.

4,289,355

ATTACHMENT FLANGE FOR FLEXIBLE CONDUIT

Bobby H. Rose, Phoenix, Ariz., assignor to Gold King Mfg. Co., Phoenix, Ariz.

Filed Dec. 17, 1979, Ser. No. 104,107
Int. Cl.³ B03B *5/00*
U.S. Cl. 299—9 **4 Claims**



1. In a dredge having a pump; a sluice box; a distributor box having a front wall, a target plate fixedly mounted in the distributor box, said target plate substantially evenly distributing into the sluice box water and solids entrained in the water which impinge the target plate; and a flexible conduit having an inlet end and an outlet end, said conduit having an outer surface having a helical projection, said conduit being operationally connected to the pump; the improvements comprising:

a flange mounted on said front wall of the distributor box, said flange having a bore sized to receive a flexible conduit within it, said bore having a helical indentation to receive the helical projection of the flexible conduit, the outlet end of said flexible conduit being threaded into the bore of the flange;

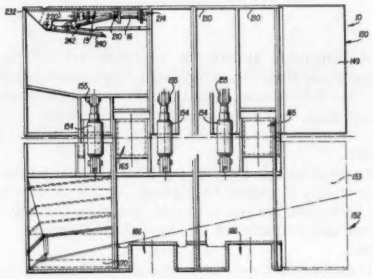
a bore through the front wall of the distributor box sized and positioned so that the outlet end of the flexible coupling can project into the distributor box; whereby the distance between the outlet end of the flexible conduit and the target plate can be varied by rotating the conduit relative to the flange.

4,289,356

SHIELD ASSEMBLIES FOR INSTALLATION IN UNDER-GROUND ROADWAYS AND ROCK EXCAVATING MACHINES INCLUDING SUCH SHIELD ASSEMBLIES

Terence R. Howard, Gravesend, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Nov. 30, 1979, Ser. No. 99,093
Claims priority, application United Kingdom, Dec. 15, 1978, 48634/78
Int. Cl.³ E21D *9/08*
U.S. Cl. 299—33 **11 Claims**



1. A shield assembly for installation in an underground roadway or tunnel, comprising an articulated upper shield assembly, a lower shield assembly, a plurality of hydraulic rams for urging the upper shield assembly upwards relatively to the lower shield assembly and a generally vertically extending telescopic guiding means extending between the lower and upper assemblies which during vertical movement of the upper shield assembly guides the upper shield assembly in a direction along the roadway or tunnel and which allows the lowermost end margins of the upper shield assembly to move outwardly relative to the adjacent end margins of the lower shield assembly whereby said shield is anchored in the roadway or tunnel.

4,289,357

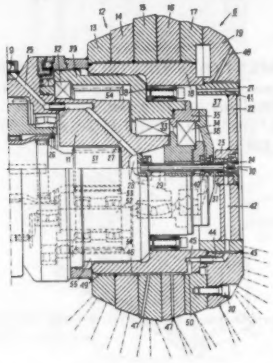
HOLLOW CUTTING HEAD

Rudolf Hintermann; Alfred Zitz; Otto Schetina, and Herwig Wrulich, all of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Jan. 16, 1980, Ser. No. 112,614
Claims priority, application Austria, Feb. 9, 1979, 998/79
Int. Cl.³ E21C *35/22*
U.S. Cl. 299—81 **9 Claims**

1. A cutting assembly for a cutting machine comprising: a hollow rotatable cutting head having a forward end and a open rear end, said cutting head having nozzles on its periphery for discharging cooling water and having internal cooling water passages connecting with the nozzles; a carrier protruding into the open end of said cutting head and forming therewith an oil chamber which is closed at its forward end by a generally transverse wall forming part of said rotatable cutting head, said

wall also closing a cavity which is provided in said cutting head, and which is in communication with the atmosphere via a passage; bearings in said oil chamber for rotably supporting said cutting head on the carrier; drive means supported by the carrier and gear connected to said cutting head at a location in said oil chamber; and a cooling water distribution system including a water supply tube carried by the carrier and arranged coaxially therein, said water supply tube passing through said generally transverse wall and through said cavity and opening



into a water distributing chamber provided within said cutting head in alignment with said water supply tube, sealing means between said water supply tube and said generally transverse wall and between said water supply tube and said water distributing chamber, and at least one longitudinally extending annual gap provided within said cutting head, said gap being connected to said water distributing chamber by at least one passage and said gap communicating with said internal cooling water passages.

4,289,358

VEHICLE BRAKING SYSTEMS

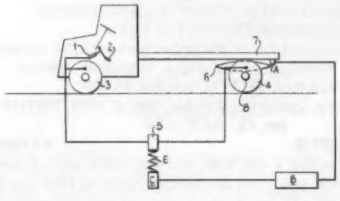
Jurgen Dufft, and Malcolm Brearley, both of Tyseley, England, assignors to Girling Limited, Birmingham, England

Filed Mar. 8, 1979, Ser. No. 19,153

Claims priority, application United Kingdom, Mar. 8, 1978, 9253/78

Int. Cl.³ B60T *8/18*

U.S. Cl. 303—22 R **19 Claims**



1. An arrangement for varying a preload on a control valve of a vehicle braking system in dependence upon vehicle loading, including sensing means on the sprung part of a vehicle for sensing the oscillation frequency of the sprung part of the vehicle while in motion and means for changing said pre-load in dependence upon said sensed oscillation frequency.

4,289,359

BRAKE FORCE REGULATOR FOR A MOTORCYCLE HYDRAULIC BRAKE SYSTEM

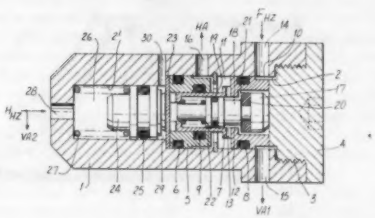
Hans-Henning Lüpertz, Darmstadt, and Volker Berisch, Hattersheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,426

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847571

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **15 Claims**



1. A brake force regulator for a motorcycle brake system comprising:

a control piston disposed coaxially within a housing, said control piston being slidable in response to pressure from a hand master cylinder and adapted to reduce brake pressure to a rear-wheel brake upon movement of said control piston into a fluid input chamber disposed in said housing connected to a pedal master cylinder, said movement being caused by said pressure of said hand master cylinder which increases the volume of a fluid outlet chamber disposed in said housing connected to said rear-wheel brake;

a fluid passageway disposed in said control piston connecting said inlet chamber to said outlet chamber;

a second piston having a closure member for said passageway disposed within said control piston, said second piston being movable in a closing direction of said passageway against the force of a first spring extending into a hollow space in said housng connected to atmosphere;

a return spring abuting one end of said control piston to urge said control piston into abutment with a stop in said housing adjacent said inlet chamber, said control piston having an effective area adjacent said inlet chamber subjected to pressure against the force of said return spring to cause displacement of said control piston in the direction of said outlet chamber;

means disposed within said housing adjacent said control piston which, upon attainment of a predetermined differential of pressure between the pressures prevailing in said inlet and outlet chambers, open said passageway after it has been closed during a braking operation; and

sealed areas of said control piston have their cross-sections dimensioned independently of each other.

4,289,360

BEARING DAMPER SYSTEM

Louis I. Zirin, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Aug. 23, 1979, Ser. No. 69,196

Int. Cl.³ F16C *35/067, 27/04*

U.S. Cl. 308—178 **2 Claims**

1. The invention comprising:

a rotating member;

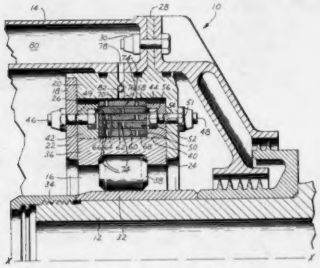
an annular bearing assembly operatively associated with and surrounding said rotating member, said bearing assembly including at least an outer annular race member;

a bearing support housing for supporting said bearing assembly during rotation of said rotating member, said housing

including an annular recess having said race member at least partially disposed therein;

an axially spaced pair of annular members disposed in said recess in said housing and fitting about said race member;

at least one shearable element fixedly connecting each of said annular members to said housing and effective for securing said annular members against movement within said recess and thereby retaining said race member concentric relative to said support housing during a first mode



of operation when said rotating member is rotating in a normal balanced condition and being subject to shearing when said rotating member is rotating in an abnormal unbalanced condition during a second mode of operation for thereby permitting relative movement of said race member and annular members within said recess; and

means for damping disposed in said recess in said bearing support housing and between said spaced pair of annular members for damping any relative movement of said race member within said recess.

4,289,361

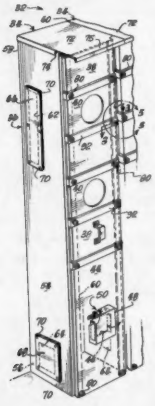
ENCLOSURE FOR METERS

Ronald J. Riedel, Diamond Bar, Calif., assignor to Ryco Mfg. Co., Industry, Calif.

Filed Jul. 16, 1979, Ser. No. 57,953

Int. Cl.[3] H02B *9/00, 1/12*

U.S. Cl. 312—100 **11 Claims**



1. An enclosure for utility meters and the like comprising:

at least a first module which includes a structure having a front, first and second side portions, a back portion and a top portion; and a plurality of panels closing said front thereof, said first and second side portions respectively including first and second step shaped members adjacent to said front, each step shaped member having a first planar surface extending toward the other step shaped member, said step shaped members each including a center section and a front section, said panels including rearwardly extending side flanges cooperating with said center sections.

4,289,362

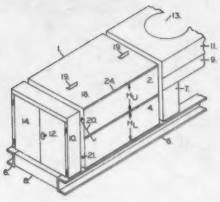
SEGMENTED DOOR FOR ENCLOSURE

Daniel E. Kramer, 2009 Woodland Dr., Yardley, Pa. 19067

Filed Jun. 12, 1979, Ser. No. 47,875

Int. Cl.[3] B65D *8/14;* **E05D** *15/26;* **A47B** *43/00*

U.S. Cl. 312—138 R **3 Claims**



1. A cabinet having a top, a side and an edge common to the top and side; an opening in the side; upper door means having height H_u for opening and closing an upper portion of the opening, said door means having an upper and a lower edge and having a closed and open condition; first hinge means for allowing the upper door to rotate about a line parallel to and substantially adjacent said common edge; lower door means having a height H_L for opening and closing a lower portion of the opening, said door means having an upper and lower edge and having a closed and open condition; second hinge means connecting the upper and lower door means for allowing the lower door to rotate up and outwardly from its closed condition, said rotation occurring about a line parallel to and substantially adjacent the lower edge of the upper door; and means for providing access to said opening by positively positioning the doors in an inverted Vee relationship on said top.

4,289,363

LOCKER CONSTRUCTION AND MULTIPLE ARRANGEMENT THEREOF

Olof I. Andersson, and Jan O. Kullander, both of Säffle, Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Nov. 13, 1979, Ser. No. 93,757

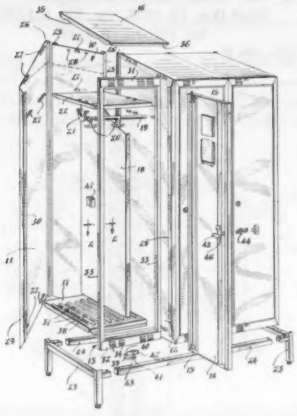
Claims priority, application Sweden, Apr. 9, 1979, 7903118

Int. Cl.[3] A47F *5/08*

U.S. Cl. 312—257 R **6 Claims**

1. A locker having a rear wall, two side walls, and a frame-shaped front wall which are all interconnected to form a box-like structure, the adjacent vertical edges of said rear and side walls having bent portions which upon abutment and pivoting hook one another to form a joint which prevents separation of said side walls and rear wall, said locker additionally comprising a generally rectangular top part and bottom part, the vertical front edges of each side wall being U-shaped in cross-section in order to tightly engage the respective vertical portions

of said frame-shaped front wall, and one leg of each of said vertical front edges having a return bent part of said bent



portion that functions to retain said frame-shaped front wall in its assembled condition.

4,289,364

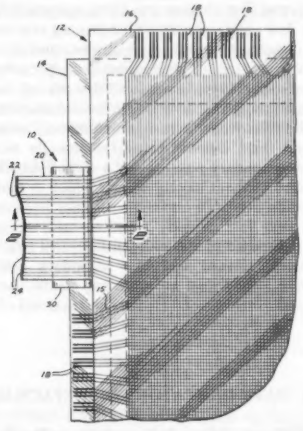
PLASMA DISPLAY PANEL FLEXIBLE CIRCUIT CONNECTION

Richard A. Strom, Eagan; Clark Bergman, St. Paul, and Paul F. Michalek, Bloomington, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 22, 1979, Ser. No. 87,134

Int. Cl.³ H01J *61/36;* **H01R** *13/635*

U.S. Cl. 339—17 CF **4 Claims**



1. In combination, a gas discharge display panel having a pair of glass substrates assembled to form a thin gas discharge display chamber, wherein each of said substrates has a plurality of electrical conductors extending in a parallel fashion and said substrates are assembled with said conductors in an orthogonal relationship to define gas discharge display areas and each substrate has conductor connection means extending from the discharge display chamber at edges thereof consisting of depressed conductor pathways etched in the substrate having the conductor element deposited in the bottom thereof at a location exterior to the discharge display chamber, said conductors typically spaced apart 0.8 mm and 0.2 mm in width, and wherein said exterior conductors are electrically and physically continuous extensions of said conductors defining the gas discharge display areas, and a system for the connection of said gas plasma display panel to electrical signals which comprises:

a conductor means having multiple conductors supported by an insulating medium and terminating in raised conductor elements which correspond in spacing to the spacing of the depressed conductors on said substrate, for carrying electrical signals;

clip members having a U-shaped portion with clip contact areas on the inside of the legs of the U-shaped portion and with a pair of flanges, one at the end of each leg of the U-shaped portion, each flange having an engaging portion parallel to and spaced apart from the associated leg of the U-shaped portion and a connecting portion for connecting said mating portion to the leg of said U-shaped portion, said flanges adapted for engaging with a spreading tool at said engaging portion thereof, for securing said conductor means in position by the application of spring forces on said conductor means and on said substrates, and

flexible force spreading means placed between said clip contact areas and said conductor means and said substrate to spread the force of application of said clip on connecting conductors from said conductor means and said panel.

4,289,365

DETACHABLE PLUG AND TRACK RECEPTACLE FOR ELECTRICAL CONNECTIONS

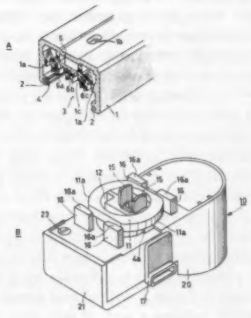
Hendrik J. Rutgers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 19, 1979, Ser. No. 86,563

Claims priority, application Netherlands, Nov. 3, 1978, 7810941

Int. Cl.³ H01R *25/14, 41/00*

U.S. Cl. 339—21 R **13 Claims**



7. A plug for detachable connection to a receptacle of the type having at least one insulated current conductor and two flanges bounding an opening extending in a longitudinal direction, said opening having a given width and providing access to a space over the current conductor, said plug comprising:

a housing having an axially extending base;

a contact pin support having at least one contact, said support extending in an axial direction,

means for mounting the contact pin support in the housing for limited relative movement along said axial direction between a retracted position and an extended position;

means for preventing insertion of the contact pin support into the opening between the flanges of the receptacle when the housing is oriented transverse to the longitudinal direction; and

means for locking the housing to the track when the base of the housing is inserted into the track and the housing is aligned in the longitudinal direction;

wherein the base of the housing can be inserted into the opening between the flanges only when the housing is oriented transverse to the longitudinal direction.

4,289,366

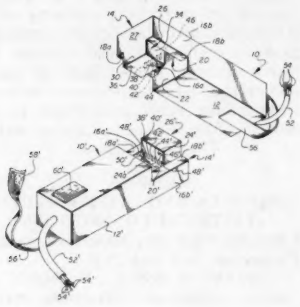
BISEXUAL ELECTRICAL CONNECTOR

Dale H. Marks, 425 Benignus, Houston, Tex. 77024

Filed Sep. 18, 1979, Ser. No. 76,773

Int. Cl.[3] H01R *23/20*

U.S. Cl. 339—49 B **21 Claims**



1. An electrical connector assembly comprising a pair of connector members having substantially identical connection formations matingly engageable by urging said formations toward each other in one directional mode, each of said connector members comprising a main body with connection formation extending therefrom; and each of said connection formations comprising wall means extending from said main body and defining a pair of elongate, spaced apart shoulders; each of said connection formations further including a female receptacle recessed inwardly from said shoulders therebetween and adjacent one thereof, a male projection adjacent said receptacle extending outwardly from said shoulders therebetween and adjacent the other end thereof, by a distance no greater than the depth of said female receptacle, and a respective generally planar universal face disposed at the interface of said male projection and said female receptacle and having an inner portion defining a wall of said female receptacle and an outer portion defining a wall of said male projection; each of said universal faces having a linear row of electrical contacts thereon, said connection formations further being configured to maintain a relative end-to-end order of the contacts of the respective rows of said universal faces, which order is the same whether said connection formations are identically oriented or matingly engaged; whereby, when the male projection of each of said connector members is inserted in the female receptacle of the other connector member, each of the shoulders of one connector member abuts a respective shoulder of the other connector member to form a closure about said male projections and female receptacles, and said assembly has a generally smooth, continuous outer surface extending transverse to said one directional mode and defined by flush adjacent portions of said two connector members; the main body of one of said connector members being generally in the form of a rectangular parallelepiped, and the shoulders of said one connector member extending generally lengthwise with respect to the respective main body.

4,289,367

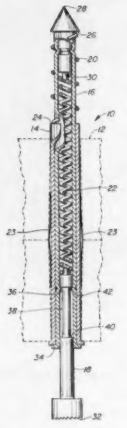
SPRING LOADED CONNECTOR PIN

Stephen M. Everett, Livermore, Calif., assignor to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Dec. 10, 1979, Ser. No. 102,055

Int. Cl.[3] H01R *4/48*

U.S. Cl. 339—64 R **5 Claims**



1. An electrical contact assembly for electrically coupling a first contact location disposed opposing a first side of a test fixture to a second contact location disposed opposing the opposing side of the test fixture for use in testing circuits on a printed circuit board, said contact assembly comprising a first element, a second element and a third element, and first biasing means and second biasing means, said first element being fixedly mounted to said test fixture, said second element being mounted to said first element and being reciprocally movable between a first primary position having an end extending a maximum distance from said first element and a second primary position, said second element being reciprocally movable with respect to said first element, said first biasing means being disposed to bias said second element toward said first primary position, said third element being mounted only to said second element, said third element being reciprocally movable between a first secondary position and a second secondary position, said third element having an end which in said first secondary position extends a maximum distance from said second element in said first primary position, said second biasing means being disposed to bias said third element relative to said second element toward said first secondary position, and wherein there is provided an electrical conductive path between said end of said second element and said end of said third element.

4,289,368

FULL MATE INDICATOR FOR DETACHABLE CONNECTORS

Alan L. Schildkraut, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 31, 1979, Ser. No. 71,441

Int. Cl.[3] H01R *13/62*

U.S. Cl. 339—89 M **5 Claims**

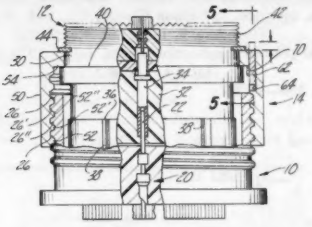
1. In a connector assembly of the type having first and second connector members adapted to be moved between a detached relationship and a fully mated relationship by a coupling nut rotatably mounted on the first connector member, each connector member including at least one terminal corresponding to a terminal on the other connector member, the corresponding terminals being coupled when the connector

members are disposed in the fully mated relationship position, the improvement comprising:

an indicator element movably supported by said coupling nut for movement between a reference position and a signal position; and

a spring biasing said indicator element toward its reference position;

said coupling nut comprising a cylindrical shell having forward and rearward faces and an internal wall, screw thread on the internal wall and a passage disposed in the internal wall, said passage extending axially from the



rearward face of said coupling nut and being in alignment with a selected part of the second connector member;

said second connector member having external screw thread adapted to be engaged by the said internal screw thread;

said indicator element being slidably disposed in said passage and having an actuator portion engageable with the selected part of the second connector member when the connector members are in said fully mated relationship whereby as the coupling nut is rotated, the connector members are moved to the fully mated relationship and the indicator element is moved to the signal position when the terminals are coupled.

4,289,369

EXCHANGEABLE GA-CU ELECTRODE FOR AN EVAPORATION SYSTEM

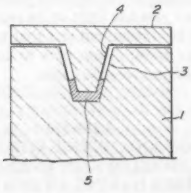
Kazuhisa Taketoshi, Sagamihara, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Division of Ser. No. 72,291, Sep. 4, 1979, Pat. No. 4,239,534. This application Feb. 15, 1980, Ser. No. 121,791

Claims priority, application Japan, Sep. 9, 1978, 53-110236

Int. Cl.³ H01R *3/08*

U.S. Cl. 339—118 R **2 Claims**



1. A set of electrodes for an evaporation system comprising:

a first electrode with a concave portion;

a second electrode with a convex portion said convex portion of said second electrode being loosely insertable into said concave portion of said first electrode, at least one of said first and second electrodes being exchangeable; and

$Ga_{1-x}Cu_x$ alloy, where $0.0001 \leqq x \leqq 0.03$, contained in said concave portion of said first electrode for filling a clearance portion between said first and second electrodes, when said second electrode is loosely inserted or fitted into said first electrode so as to electrically contact said first electrode with said second electrode.

4,289,370

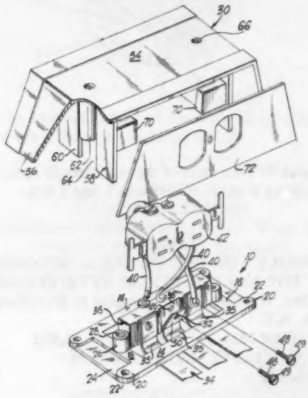
FLAT CONDUCTOR CABLE ELECTRICAL CONDUCTOR JUNCTION MEANS

Glenn E. Storck, Long Valley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed May 25, 1979, Ser. No. 42,370

Int. Cl.³ H02B *1/06*

U.S. Cl. 339—125 R **18 Claims**



1. Electrical connector junction means for use with flat conductor cable of the type including outer insulation and a conductor therewithin, said cable adapted to lie along a floor, said electrical connector junction means comprising:

a base having a substantially flat support surface for mounting of said base on a floor and having an opening therethrough for receiving through the opening a flat conductor cable lying on the floor when said base is mounted on the floor over the flat conductor cable;

a conductor termination for making electrical contact with a conductor through the outer insulation of said cable, said conductor termination having an insulation piercing portion adjacent each side of said cable, each portion having a fastener receiving opening therethrough;

a support member secured to said base and extending above said support surface, said support member including at least one mounting surface for a terminated conductor of the flat conductor cable extending through said opening in said base; and

a fastener extending through said openings in said conductor termination portions for fastening said conductor termination and a second conductor to said mounting surface to thereby establish electrical connection between said conductor of the flat cable and said second conductor.

4,289,371

OPTICAL SCANNER USING PLANE LINEAR DIFFRACTION GRATINGS ON A ROTATING SPINNER

Charles J. Kramer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1979, Ser. No. 44,000

Int. Cl.³ G02B *27/17*

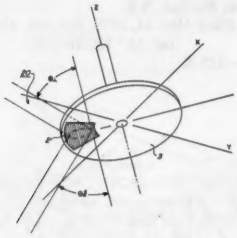
U.S. Cl. 350—3.71 **17 Claims**

1. An optical scanning system including a spinner having formed thereon at least one plane linear diffraction grating having a constant grating period d,

a reconstruction light source of wavelength λ_r which provides a beam of light directed at an angle of incidence θ_i to illuminate said grating,

means for rotating said spinner so that said grating rotates through a rotation angle θ_R and diffracts a portion of the incident light at a diffraction angle θ_d

said incidence angle θ_i having a value of between 0° and 89.445° said diffraction angle θ_d, having a value between



38.17° and 90°, the ratio of the wavelength λ_r to the spacing d having a value of between 1 and 1.618.

4,289,372

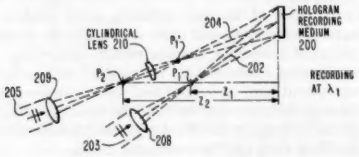
TECHNIQUE FOR RECORDING A HOLOGRAM SUITABLE FOR USE IN OPTICAL RETRIEVAL SYSTEM

Burton R. Clay, Wayland, Mass., assignor to RCA Corporation, New York, N.Y.

Filed May 29, 1979, Ser. No. 42,922

Int. Cl.³ G03H *1/04, 1/16*

U.S. Cl. 350—3.83 **9 Claims**



1. In a hologram recording system for recording an interference pattern having Fresnel properties in at least one of two orthogonal directions, on a recording medium with two angularly displaced interfering beams of coherent energy of a first given wavelength λ_1 to produce a certain type of hologram, said certain type of hologram being responsive on readout to the illumination thereof with a plane wave of coherent wave energy of a second given wavelength λ_2 which is oriented substantially normal to the plane of said hologram for diffractively deriving an output beam of coherent wave energy which coverges in at least said one of said two orthogonal directions and which has a crossover spaced a preselected distance Z_3 from the plane of said hologram; said hologram recording system comprising:

coherent wave energy translation means for simultaneously illuminating an area of said recording medium with (1) a first incident beam of said λ_1 coherent wave energy which diverges in at least said one of said two orthogonal directions from a first predetermined crossover spaced a distance substantially equal to Z_1 from the plane of said recording medium and (2) a second incident beam of said λ_1 wavelength coherent wave energy which diverges in at least said one of said two orthogonal directions from a second predetermined crossover spaced a distance substantially equal to Z_2 from the plane of said recording medium, and

wherein the respective values of distances Z_1 and Z_2 are related to the preselected distance Z_3 substantially in accordance with the following equations:

$$\frac{1}{Z_1} - \frac{1}{Z_2} = \frac{1}{\alpha Z_3}, \text{ and}$$

-continued

$$\frac{1}{Z_1^3} - \frac{1}{Z_2^3} = \frac{1}{\alpha Z_3^3},$$

where α is equal to the ratio of λ_2 to λ_1.

4,289,373

BIDIRECTIONAL OPTICAL FIBER TRANSMISSION SYSTEM

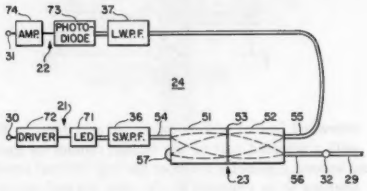
Shigetoki Sugimoto, and Kouichi Minemura, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 65,223

Claims priority, application Japan, Jul. 6, 1979, 54-86238

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.16 **6 Claims**



1. A bidirectional optical fiber transmission system comprising

a first transmitter-receiver set comprising of a firsst light receiving means, a first light transmitting means which has a first light emitting diode as light source, and a first downstream-upstream dividing means which has a short wavelength pass filtering means to filter the part of the spectrum, emitted by said first light emitting diode, shorter in wavelength than a prescribed value and another filtering means to pass the light to be received, and separates the light to be transmitted and that to be received;

a second transmitter-receiver set comprising of a second light receiving means, a second light transmitting means which has, as light source, a second light emitting diode whose emission spectrum at least partly overlaps that of said first light emitting diode, and a second downstream-upstream dividing means which has a long wavelength pass filtering means to filter the part of the spectrum, emitted by said second light emitting diode, longer in wavelength than the prescribed value and another filtering means to pass the light to be received, and separates the light to be transmitted and that to be received, and

an optical fiber transmission path to connect said first and second transmitter-receiver sets.

4,289,374

METHOD OF AND DEVICE FOR PROVIDING A CONCENTRIC ENVELOPE ON AN END OF AN OPTICAL FIBER, AND FIBER HAVING AN END PROVIDED WITH A CONCENTRIC ENVELOPE IN ACCORDANCE WITH THE METHOD

Adrianus J. J. Franken; Giok D. Khoe; Gerard Kuyt; Johannes H. F. M. Van Leest; Antonius J. A. Nicia; Cornelis J. T. Potters, and Hendricus F. G. Smulders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 25, 1979, Ser. No. 78,733

Claims priority, application Netherlands, Sep. 26, 1978, 7809725

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.20 **14 Claims**

1. A method of providing an envelope on an end of an opti-

cal fiber, said envelope having an outer surface which is at least partly concentric with a light-conductive core of the fiber end, said method comprising the steps of:

positioning the fiber end opposite an optical observation means having an axis of observation;

radiating light into the fiber such that the light emerges from the fiber end and is incident on the optical observation means;

observing the light beam emerging from the optical observation means; and

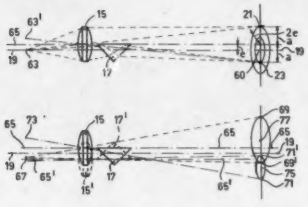
displacing the fiber end transverse to the axis of observation until the observed light beam occupies a predetermined position with respect to the axis of observation;

CHARACTERIZED IN THAT the method further comprises the steps of:

providing an envelope on the fiber end;

arranging the fiber end in a support;

splitting the light beam emerging from the fiber end into two subbeams by a beam-splitting assembly, said beam-splitting assembly having an optical axis which is eccentric with respect to the axis of observation;



rotating the beam-splitting assembly around the axis of observation, each of said subbeams tracing a circular image, movement of the fiber end in a direction tranverse to the axis of observation causing the circular images to move transverse to the axis of observation and in opposite directions with respect to each other;

observing the circular images to determine whether they are concentric or eccentric;

moving the fiber end and the envelope transverse to the axis of observation until the circular images are concentric, if the circular images were initially eccentric, the light-conductive core then being situated on the axis of observation; and

machining at least a part of the outer surface of the envelope to be concentric with the axis of observation by means of a machining tool which rotates around the axis of observation of the optical observation means.

4,289,375

OPTICAL ELEMENT FOR INCORPORATION INTO OPTICAL TRANSMISSION MEANS

Axel Andersen, Gentofte; Poul U. Knudsen, Hellerup, and Knud B. Jensen, Skodsborg, all of Denmark, assignors to Aktieselskabet Nordiske Kabel-og Traadfabriker, Copenhagen, Denmark

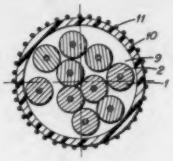
Filed Nov. 4, 1977, Ser. No. 848,695

Claims priority, application Denmark, Nov. 9, 1976, 5052/76

Int. Cl.³ G02B *5/16*

U.S. Cl. 350—96.23 **11 Claims**

11. Optical transmission means comprising at least one optical element located in a sheath wherein said optical element consists of an optical fiber provided with a coating with a substantially circular cross section applied essentially coaxially closely around the fiber, to which coating is imparted such an adhesion to the optical fiber that a contraction tendency in the coating brought about in connection with the application of the coating affects the fiber with such an axial compressive force in its whole length that the force causes a real shortening of the fiber and a corresponding increase of the elongation at the break of the fiber, said shortening amounting to at least



0.5% of the original length of the fiber when otherwise the element is not affected by external forces.

4,289,376

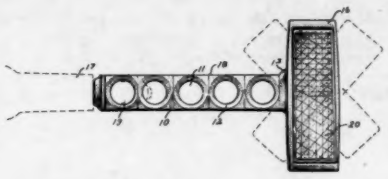
LIGHT REFLECTORS

Dragan Vukadinovic, 4812 Woodrow Ave., Parma, Ohio 44134

Filed Jul. 30, 1979, Ser. No. 61,607

Int. Cl.³ G02B *5/12*

U.S. Cl. 350—99 **1 Claim**



1. A light reflector assembly adapted to be attached to the valve of an automobile tire and secured in place by the valve cap; said light reflector assembly comprising:

a metallic strip of predetermined length having a series of equally sized and spaced holes therethrough, said holes having rims integral with the surface of said strip;

a plurality of linear indentations spanning the breadth of said strip, located between said holes and adjacent to said rims;

a segment at one end of said strip, perpendicularly bent therefrom, having a hole suitably sized to receive the threaded portion of said valve;

a disk-shaped portion at the other end of said strip, integral with said strip, having a centrally located screw therethrough, said screw connecting said strip to the back of a substancially rectangular plastic light reflector housing, said housing having a correspondingly shaped and sized light reflector situated therein.

4,289,377

PROJECTING APPARATUS

Yoshiya Matsui; Setsuo Minami, and Noritaka Mochizuki, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1979, Ser. No. 23,268

Claims priority, application Japan, Apr. 5, 1978, 53-40053

Int. Cl.³ G03B *27/48*; G02B *27/10, 27/28*

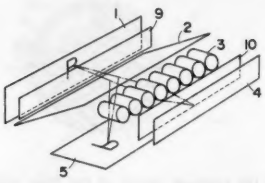
U.S. Cl. 350—169 **4 Claims**

1. A projecting apparatus comprising:

an array of rod-shaped lenses for forming the image of an object, each of said lenses having only two lens surfaces and an axial length larger than the effective diameter thereof:

a plane mirror positioned in the vicinity of the intermediate image plane of said array of rod-shaped lenses, wherein the principal ray of light rays incident on said mirror is traced by the principal ray of light rays reflected by said plane mirror;

a polarizing beam splitter positioned obliquely to the optical axis of said lens array and being disposed between the object and the lens array; and



optical means for changing the polarizing direction of the light to a direction perpendicular thereto.

4,289,378

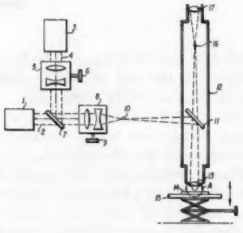
APPARATUS FOR ADJUSTING THE FOCAL POINT OF AN OPERATING LASER BEAM FOCUSED BY AN OBJECTIVE

Ernst Remy, No. 22, Georgenstrasse, 8 Munich 50, and Eberhard Unsöld, 16a, Dr. Hofmeister Strasse, 4042 Oberschleisheim, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 917,699, Jun. 21, 1978, abandoned, which is a continuation of Ser. No. 752,764, Dec. 20, 1974, abandoned. This application Oct. 15, 1979, Ser. No. 84,483

Int. Cl.³ G02B *27/14, 21/06*

U.S. Cl. 350—174 **4 Claims**



1. Apparatus for adjusting the focal spot of a working laser beam onto a microscopic target region within a transparent biological object observed under a microscope to locate that focal spot a predetermined controllable microscopic distance from an interface of said object, said apparatus comprising

(a) a microscope having an objective, an eyepiece, a support for said object and means to move said support so as to bring the target region of said object into the focusing plane of said objective;

(b) a working laser for emitting a parallel laser beam and an auxiliary laser for emitting a parallel laser beam in the visible wavelength region along separate paths;

(c) means for collinearly superimposing said two laser beams from said paths and for introducing the superimposed beams into the microscope so as to be focused jointly through said objective onto said object;

(d) first variable focusing means interposed in the path of one of said laser beams;

(e) second variable focusing means interposed in the path of said superimposed working and auxiliary laser beams, said second variable focusing means comprising a lens arrangement producing intermediate focal spots of said two laser beams and means for varying the distance of said intermediate focal spots from said microscope objective;

(f) first control means for controlling said first variable focusing means so as to produce a longitudinal spacing of predetermined distance between the focal spots produced by said objective; and

(g) second control means for controlling said second variable focusing means independently of said first variable focusing means for moving the two focal spots jointly without varying the distance therebetween;

(h) whereby the focal spot of said auxiliary laser beam may be made to appear on an interface of said object and said working laser beam may be focused said predetermined distance from said interface.

4,289,379

OPTICAL SYSTEM HAVING A VARIABLE FOCAL LENGTH

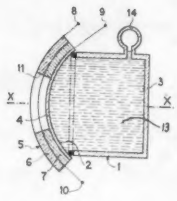
Guy Michelet, Paris, France, assignor to Quantel S.A., France

Filed Apr. 13, 1978, Ser. No. 896,079

Claims priority, application France, Apr. 27, 1977, 77 12801; Mar. 29, 1978, 78 09152

Int. Cl.³ G02B *3/14;* **G02F** *1/29*

U.S. Cl. 350—419 **13 Claims**



1. An optical system having a variable focal length, comprising a container defined by walls at least a part of which walls is of transparent material, an index adapting medium filling said container, the optical system having an optical axis which extends through at least a first of said walls, at least said first wall of said walls comprising a piezoelectric bimorph structure comprising interconnected adjoining layers and means for applying voltage to said interconnected layers for modifying the curvature of said first wall in accordance with the voltage applied to the bimorph structure through said voltage applying means.

4,289,380

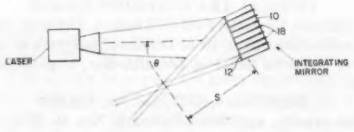
LASER BEAM LINEAR ADJUSTABLE INTEGRATING MIRROR

Thomas R. Tucker, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1980, Ser. No. 137,045

Int. Cl.³ G02B *5/08*

U.S. Cl. 350—292 **8 Claims**



1. An integrating mirror system for producing uniform intensity of reflected incident radiation at a target off-axis from the incident radiation which comprises:

a plurality of rectangular block segments;

each of said block segments having flat faces and including an edge defining a reflective front face;

means for assembling said block segments in flat face stacked adjacency with their edge defined front faces in initial general planar alignment with each other defining a substantially continuous reflective surface; and

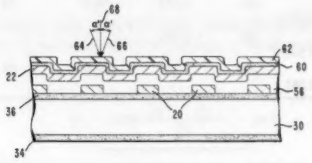
means for changing the angle between adjacent block segments in said assembly in a uniform manner to cause an overlapping of reflected radiation at a spatial target distance.

4,289,381

HIGH SELECTIVITY THIN FILM POLARIZER

Hugh L. Garvin, Malibu, and Douglas A. Pinnow, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 2, 1979, Ser. No. 54,361
Int. Cl.³ G02B *5/30;* B05D *3/00*
U.S. Cl. 350—320 **4 Claims**



1. A method for making a thin film polarizer on a substrate surface comprising:

placing a first metal layer on said surface;

first photolithographically forming a grid in said first metal layer defined by the interference pattern of at least two coherent beams;

placing an insulating layer over said first metal layer;

placing a second metal layer over said insulating layer;

placing an anti-reflective coating over said second layer;

placing a photoresistive layer over said anti-reflective coating; and

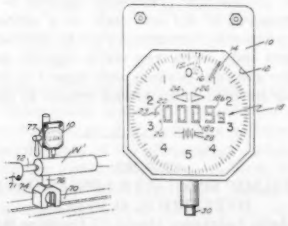
second photolithographically forming a grid in said second metal layer defined by the interference pattern of at least two coherent beams, wherein said anti-reflective coating substantially prevents formation of standing waves within said photoresistive layer during said second photolithographic forming step.

4,289,382

MEASUREMENT SYSTEM FOR MACHINE PARTS

Earl S. Clark, Coventry, R.I., assignor to Federal Products Corporation, Providence, R.I.

Continuation-in-part of Ser. No. 893,353, Apr. 14, 1978, abandoned, and Ser. No. 24,398, Mar. 27, 1979, abandoned. This application Dec. 28, 1979, Ser. No. 107,766
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—331 R **1 Claim**



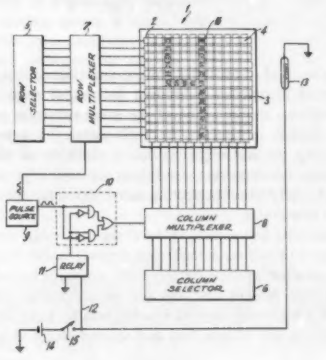
1. A measurement system for machine parts comprising a case, a support means for movably clamping the case to the support whereby the position of the case may be varied relative to a machine part, a measuring member extending from said case for engagement with the machine part, said measuring member coupled to a transducer, said case having a configuration with at least one circular face, a plurality of groups of segments disposed in a circle around the periphery of said face, said transducer having an analog output, an analog-to-digital converter, a signal processing circuit, said circuit having an output coupled to a decoder driver for the circular segments and a decoder driver for the digital display, the central portion of said face being provided with an opening, a plurality of binary segments arranged in a predetermined manner within said opening to provide a digital display, a digital display within said opening displaying at least three significant digits, two digits of said display corresponding to the analog reading of the plurality of radially extending segments mounted in the circular pattern on said face, the third digit corresponding to an interpolated numeral of the analog display.

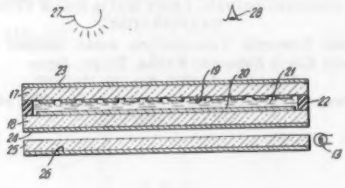
4,289,383

LIGHTED DOT MATRIX DISPLAY

Jack Schwarzschild, Stamford, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Sep. 4, 1979, Ser. No. 71,967
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—334 **2 Claims**





1. In an electrooptic display of the type operable to provide an image viewable either in the transmissive or reflective modes, with means to selectively activate a plurality of electrooptic segments to provide said image, the improvement comprising:

illuminating means disposed to provide light at the back of said display when it functions in a transmissive mode, said illuminating means comprising an incandescent backlight,

image reversal means for electrically reversing the image on said display, and,

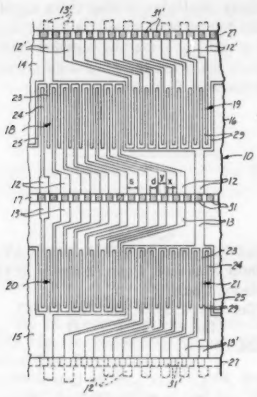
a manually actuated switch connected to simultaneously actuate said image reversal means and said illuminating means.

4,289,384

ELECTRODE STRUCTURES AND INTERCONNECTING SYSTEM

Norbert E. Samek, Sierra Madre, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Apr. 30, 1979, Ser. No. 34,893
Int. Cl.³ G02B *1/03*; H05K *1/11, 1/18*
U.S. Cl. 350—392 **31 Claims**



1. In a method of providing interconnections for several first and second electrodes extending in mutual registration on opposite faces, respectively, of the same substrate to an edge portion thereof, comprising in combination the steps of:

providing on said edge portion a plurality of electrically conductive deposits extending across said edge portion for electrically interconnecting corresponding first and second electrodes;

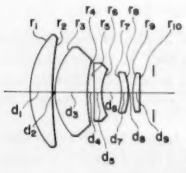
said deposits being distributed along said edge portion in a pattern including a recurring deposit width smaller than the smallest spacing between any adjacent two electrodes of either of said first and second electrodes, alternating with a recurring deposit spacing smaller than the smallest width of any of said first and second electrodes.

4,289,385

PHOTOGRAPHIC LENS WITH REAR STOP DIAPHRAGM

Masakazu Yamagata, Tsurugashima, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1980, Ser. No. 118,699
Claims priority, application Japan, Feb. 20, 1979, 54-18915
Int. Cl.³ G02B *9/60*
U.S. Cl. 350—468 **7 Claims**



1. A lens system comprising, in order from the object, a first single meniscus lens, a second single meniscus lens, a third single negative lens, a fourth single meniscus lens and a fifth single positive lens wherein:

f = 100		$F_{NO.}$	1:2.8	$2\omega = 24°$	K = 1.049
				^{n}d	$^{\nu}d$
r_1	45.735	d_1	10.853	1.60311	60.7
r_2	210.900	d_2	1.290		
r_3	33.385	d_3	15.872	1.51633	64.1
r_4	77.025	d_4	3.155		
r_5	3392.655	d_5	3.591	1.80518	25.4
r_6	22.917	d_6	9.900		
r_7	−33.391	d_7	3.353	1.74077	27.8
r_8	−29.895	d_8	2.321		
r_9	43.549	d_9	3.234	1.66446	35.8
r_{10}	238.081				

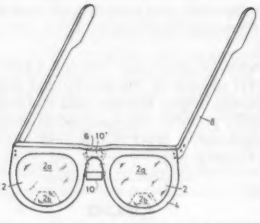
$\Sigma d = 53.569$

4,289,386

EYEGLASSES OF THE VARIABLE-LENS TYPE, AND POSITIONING MEMBER PARTICULARLY USEFUL THEREWITH

Aharon Brandstetter, 12 Oppenheimer St., Tel Aviv, Israel

Filed Oct. 23, 1979, Ser. No. 87,513
Claims priority, application Israel, Nov. 30, 1978, 56092
Int. Cl.³ G02C *5/04*
U.S. Cl. 351—128 **4 Claims**



1. A pair of eyeglasses of the variable-lens type including an eyeglass frame mounting the lenses, and a positioning member engageable with the wearer's nose for aligning the lenses of the eyeglass frame with the wearer's eyes, characterized in that the eyeglass frame includes a pair of arms pivotably supporting said positioning member, which arms are in turn pivotably mounted at their ends to the eyeglass frame to assume either a first position wherein the positioning member is above the pivotable mounting of the arm ends, or a second position wherein the positioning member is below the pivotable mounting of the arm ends, to thereby stably support the eyeglass frame in either a normal position with respect to the wearer's eyes, or in an elevated position with respect to the wearer's eyes.

4,289,387

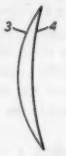
OPHTHALMIC SPECTACLE LENSES HAVING A HYPERBOLIC SURFACE

Mohammed Jalie, Lanchbury House, 32 Ferndene Rd., London, England (SE24 OAB)

Filed Jan. 2, 1979, Ser. No. 607
Claims priority, application United Kingdom, Aug. 9, 1978, 32738/78
Int. Cl.³ G02B *3/04*; G02C *7/02*
U.S. Cl. 351—159 **6 Claims**

1. An ophthalmic spectacle lens comprising a singlet having

an optical axis and power within a range of −20 diopters to +7 diopters, the singlet having anterior and posterior surfaces which are both curved, at least one of said surfaces being of a



hyperboloidal form symmetrically disposed about said optical axis, said hyperboloidal form having in axial section a locus defined by:

$$y^2 = 2000\frac{(n'-n)x}{Fo} - px^2$$

wherein p has a value between 0 and −4 inclusive, and

$$Fo = \frac{1000(n'-n)}{ro}$$

where ro is the radius of said surface at the optic axis of the lens and (n'−n) is the difference between the refractive indices of the media bounding said surface, x and y being orthogonal co-ordinates and all dimensions being in millimeters.

4,289,388

AUTOMATIC FOCUS ADJUSTING DEVICE OF A CAMERA HAVING A SELF-TIMER

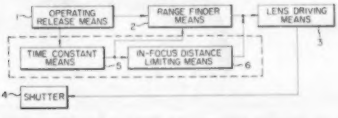
Hiroshi Wakabayashi, Yokohama, and Yoshiaki Ohtsubo, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 24, 1980, Ser. No. 190,408

Claims priority, application Japan, Sep. 29, 1979, 54/124707

Int. Cl.³ G03B *3/00, 17/40*

U.S. Cl. 354—25 **6 Claims**



1. In an automatic focus adjusting device of a camera including range finder means responsive to a release operation to detect the distance to an object lying at a position corresponding to a specific area of the phototaking picture plane, and means for driving a phototaking lens so as to be focused to the distance detected by said range finder means, said camera further including timer means and being capable of effecting said release operation in response to the operation of said timer means, the improvement comprising:

limit means operable in response to said timer means to limit the amount of movement of said phototaking lens driven by said driving means so that when the distance detected by said range finder means exceeds a predetermined distance, said phototaking lens is focused to the predetermined distance.

4,289,389

EXPOSURE CONTROL DEVICE FOR A CAMERA

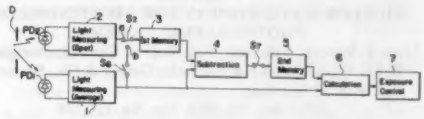
Toshio Kobori, Sakai, and Masayoshi Sahara, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Continuation of Ser. No. 942,830, Sep. 12, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 106,098

Claims priority, application Japan, Sep. 13, 1977, 52-110780

Int. Cl.³ G03B *7/083*

U.S. Cl. 354—31 **2 Claims**



1. Exposure control device for a camera comprising:

a diaphragm aperture capable of being varied from an initial aperture size subsequent to the camera release operation;

means for measuring light through the diaphragm aperture to produce a first light measuring output;

first means for optionally storing said first light measuring output prior to the camera release operation; and

means for controlling the camera exposure based on a combination of a first light measuring output stored by said first storing means, a second light measuring output obtainable from said light measuring means within a period defined between the camera release operation and the initiation of the variation of the diaphragm aperture, and a third light measuring output obtainable from the light measuring means after the initiation of the variation of the diaphragm aperture, and said controlling means includes second means for storing the difference between the first and second light measuring outputs, and means for calculating the third light measuring output with the difference stored by said second storing means.

4,289,390

BELLOWS TYPE FOLDING CAMERA

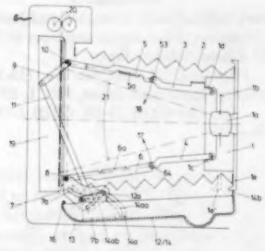
Peter Lermann, Naring; Karl Wagner; Herbert Schultes, both of Munich, and Gunter Fauth, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 22, 1980, Ser. No. 181,373

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934214

Int. Cl.³ G03B *17/04*

U.S. Cl. 354—187 **13 Claims**



1. A bellows type folding camera having a housing, a displaceable objective support, flexible bellows arranged between said housing and said objective support, and a mechanism for controlling the displacement of the objective support, said mechanism comprising two pairs of lower and upper struts symmetrically hinged between said housing and said objective support, each strut being formed of at least two sections hinged

one to the other to rotate about an axis between a collapsable position and an extended position in which said pairs of struts reinforce said bellows, the corresponding sections of the upper struts and respectively of the lower struts being rigidly interconnected by cross-pieces extending parallel to each other; actuation means including a cam drive arranged at one of the pairs of struts; and coupling means for directly connecting said cam drive to said one pair whereby said other pair of struts is connected to said drive via said cross-pieces.

4,289,391

SHUTTER SPEED DISPLAY FOR VIEWFINDER OF A PHOTOGRAPHIC CAMERA

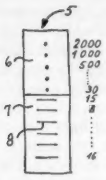
Hans J. Rodeck, Erkerode, Fed. Rep. of Germany, assignor to Rollei-Werke Franke & Heidecke GmbH & Co., Brunswick, Fed. Rep. of Germany

Filed Jan. 30, 1980, Ser. No. 116,775

Claims priority, application European Pat. Off., Jan. 30, 1979, 79100261

Int. Cl.³ G03B *13/02, 17/20*

U.S. Cl. 354—219 **6 Claims**



1. A viewfinder display for a photographic camera having a viewfinder, said viewfinder including a viewing opening and a line of light emitting diodes for indicating a range of camera shutter speed settings, said line having at least first and second portions, said one of said portions of said line of light emitting diodes corresponds to shutter speed settings which are not conducive to hand-held camera operation, said viewfinder display including means for visually differentiating, to an operator looking into said viewfinder, light emitted from said first portion of said line from light emitted from said second portion of said line, wherein said means comprises:

means for refracting light from said first portion of said line; and means for non-refractively passing light from said second portion of said line.

4,289,392

PENTAGONAL ROOF REFLECTING MIRROR ASSEMBLY

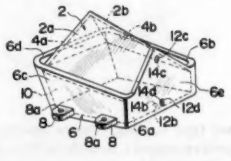
Toshio Kobori, Sakai; Yasuo Yamazaki, and Isamu Uchida, both of Kawachinagano, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1980, Ser. No. 115,182

Claims priority, application Japan, Feb. 1, 1979, 54-12619[U]

Int. Cl.³ G03B *13/08;* **G02B** *1/00*

U.S. Cl. 354—225 **10 Claims**



1. An improved pentagonal lightweight roof type reflecting mirror assembly, for mounting on a camera, free of dust and debris on its reflecting surfaces and not subject to condensation by trapped water vapor, comprising:

a hollow, substantially airtight, plastic body member having a plurality of internal reflecting surfaces, at least one side of the body member capable of transmitting an image for internal reflection while an adjacent second side is capable of transmitting the image from the interior of the body member to a viewer, a third side of the body member is approximately diagonally juxtaposed across from the common edge of the first and second side and includes an aperture positioned outside the optical axis and extending therethrough, and

a sealing member including a ventilative foamed plastic member fixed in and extending across the aperture, the sealing member being opaque to the transmission of light onto the reflective surfaces, while transmitting water vapor.

4,289,393

CAMERA SUPPORTING DEVICE FOR LOW ANGLE OR CLOSE-UP PHOTOGRAPHY

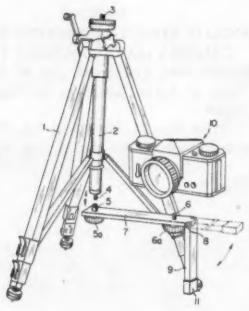
Michio Kawazoe, 30-11, 5 chome, Higashi Narita Suginamiku, Tokyo, Japan

Filed Nov. 21, 1979, Ser. No. 96,392

Claims priority, application Japan, Apr. 24, 1979, 54-55672[U]

Int. Cl.³ G03B *17/00;* **F16M** *11/26*

U.S. Cl. 354—293 **9 Claims**



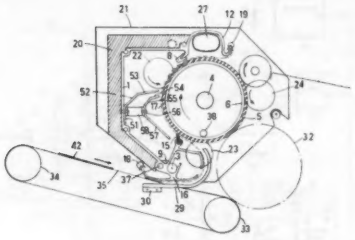
1. A camera supporting device for low angle or close-up photography comprising; a tripod having a plurality of foldable legs and an elevator; a camera supporting member; means for attaching one end of said camera supporting member to the lower end of said elevator comprising a threaded screw on the lower end of said tripod elevator and a lever operated socket on one end of said supporting member having a releasable mating plug with a female threaded hole; said camera supporting member extending horizontally beyond the legs of the tripod when the tripod legs are unfolded; means for attaching a camera to the other end of said supporting member; and an adjustable stay pivotally attached to the other end of said camera supporting member, said stay adapted to be adjusted to contact the surface on which the tripod is resting thereby providing a supporting force for the camera supporting member.

4,289,394

PROCESS AND APPARATUS FOR CONVERGING DEVELOPING VAPORS IN DIAZOCOPY MACHINES

Claude Michel, Freulleville, France, assignor to Rhone-Poulenc Systemes, Creteil, France

Filed Jun. 22, 1979, Ser. No. 50,995
Claims priority, application France, Jun. 23, 1978, 78 18787
Int. Cl.[3] G03D *7/00*
U.S. Cl. 354—299 6 Claims



1. An apparatus for developing a copy support coated with a diazo sensitive layer previously exposed through an original in an ultraviolet exposure station, said apparatus comprising:

(a) chamber means for enclosing a developing system;

(b) forming means for forming ammonia vapors within said chamber means;

(c) guide means for guiding and moving the copy support within the chamber means;

(d) converging means for converging the ammonia vapors formed by said forming means onto the copy support as the copy support is moved past the converging means and within the chamber means; and

(e) accelerating means for accelerating the ammonia vapors and concentrating the ammonia vapors onto the sensitive layer of the copy,

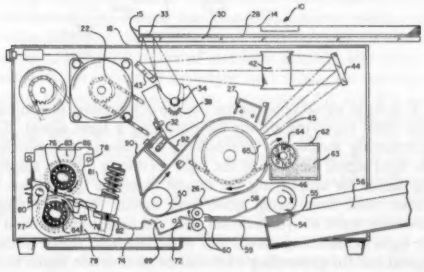
wherein said converging means and accelerating means is a single static converging means applying the ammonia vapors by a venturi effect created by static converging means, said converging and accelerating means not requiring any means of addition of external energy.

4,289,395

COPY SHEET DEFLECTOR FOR AN ELECTROPHOTOGRAPHIC COPIER

John J. Stelben, Greenwich, Conn., assignor to Pitney Bowes, Inc., Stamford, Conn.

Filed Dec. 28, 1979, Ser. No. 108,085
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 BE 3 Claims



1. In a photocopy machine having operating instrumentalities for reproducing an original document onto a copy sheet and having a prescribed path of travel therethrough for the copy sheet, the combination therewith of apparatus for feeding and guiding the copy sheet along the path of travel and for preventing the copy sheet from being diverted from the path of travel and becoming entangled in the operating instrumentalities, said apparatus comprising:

A. a web of photoconductive material,

B. means supporting a portion of said web such that said portion is disposed in and moves along the path of travel of a copy sheet, at least a part of said supporting means comprising a roller

(1) around which the web passes for a portion of its circumference sufficient for the web to effect at least a partial reversal of its direction of movement around said roller, and

(2) which has a sufficiently small diameter such that a copy sheet in contact with the web will not normally follow the web around said roller,

C. a pair of rotating rollers disposed in the path of travel of the copy sheet and between which the copy sheet is intended to pass, said rollers being spaced from said supporting roller by a distance less than the length of a copy sheet,

D. guide means disposed between said supporting roller and said pair of rollers for guiding the leading edge of a copy sheet toward the nip of said pair of rollers, and

E. deflector means disposed adjacent said supporting roller and in juxtaposition with the portion thereof where said partial reversal of the web direction of movement is effected, said deflector means being sufficiently close to the web surface to prevent the trailing edge of the copy sheet from following the web along the reverse direction thereof in the event that the leading edge of the copy sheet does not pass through said pair of rollers,

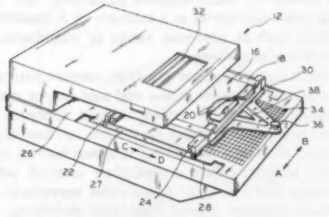
whereby the copy sheet rumples in front of said deflector means on said guide means and does not become entangled in the operating instrumentalities of the photocopy machine.

4,289,396

MICROFICHE READER PRINTER WITH INTERCHANGEABLE CARRIAGES

Alexander G. Jastrab, Hartford, Wis., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 19, 1979, Ser. No. 95,703
Int. Cl.[3] G03B *13/28*
U.S. Cl. 355—45 8 Claims



1. A Microfilm reader/printer comprising a film carrier means mounted on two orthogonally oriented pairs of spaced, parallel rails whereby said carrier means may glide over said rails to any position defined by the rails, keying guideways means formed by said film carrier in association with said rails for releasably enabling said film carrier to be secured onto said rails whereby a plurality of said film carriers may be used interchangeably, means for indicating the position of any said interchangeable film carriers relative to an optical path through said reader and means for securing saidrails to said reader/printer whereby neither of said pairs of rails is removed from said reader/printer when changing film carriers.

4,289,397

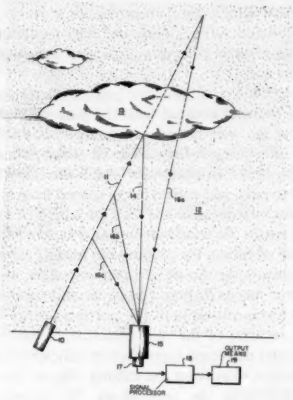
LASER CEILOMETER SIGNAL PROCESSING MEANS

Irving Itzkan, Boston; Herbert P. Kent, Swampscott; Michael E. Mack, Manchester, all of Mass., and Richard G. Morton, Richland, Wash., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Jul. 20, 1979, Ser. No. 59,440

Int. Cl.[3] G01C *3/08;* G06J *7/12;* G06G *7/18*

U.S. Cl. 356—5 **20 Claims**



1. In a pulsed-laser lidar, comprising a pulsed laser source for projecting toward a target a pulsed laser beam through a turbid medium bearing a distribution of suspended particles;

radiation collector means for gathering target return radiation scattered from the pulsed laser beam by the target, superimposed upon background return radiation scattered from the pulsed laser beam by the distribution of suspended particles;

electro-optical detector means for receiving said superimposed return radiations gathered by said collector means and transducing said superimposed return radiations to a corresponding electrical signal pulse waveform comprising a target signal pulse, from received and transduced target return radiation, superimposed upon a background signal waveform, from received and transduced background return radiation; and

output means for receiving and presenting said electrical signal pulse waveform as a measure of at least one target attribute such as presence, range or magnitude, the improvement comprising:

electrical signal processing means, intermediate said electro-optical detector means and said output means, said electrical signal processing means applying, to said electrical signal pulse waveform, a time-distributed signed electrical weighting function having negligible total weight within a total time interval which can contain said electrical signal pulse waveform and said time-distributed signed electrical weighting function having alternations of sign separated by time intervals of the order of the width of said target signal pulse.

4,289,398

OPTICAL TIME DOMAIN REFLECTOMETER

Roger E. Robichaud, Jemez Springs, N. Mex.

Filed Dec. 4, 1978, Ser. No. 965,889

Int. Cl.[3] G01N *21/84*

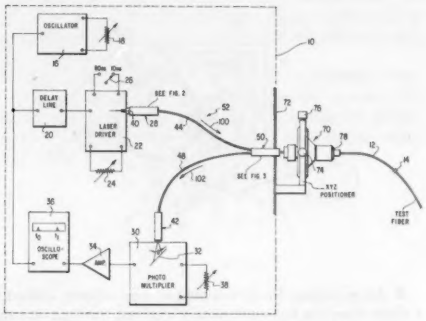
U.S. Cl. 356—73.1 **7 Claims**

1. An optical time domain reflectometer for determining the location of a discontinuity in an optical fiber waveguide comprising

a pulsed light source,

an optical detector, and

optical coupling means for coupling said optical fiber waveguide to said pulsed light source and said optical detector, said optical coupling means including first and second optical fibers each having a central core surrounded by cladding material, one end of said first optical fiber being positioned adjacent said pulsed light source and one end of said second optical fiber being positioned adjacent said



optical detector, portions of the cladding material of each of said first and second optical fibers extending from the other ends of said fibers being fused together to form a composite portion wherein the central cores of said first and second optical fibers are circular, touching and surrounded by a continuum of cladding material, said optical fiber waveguide being positioned adjacent the end of said composite portion and coaxial therewith.

4,289,399

LIGHT SIGNAL OBSERVATION DEVICE

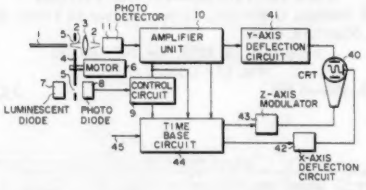
Kozo Uchida, Fussa, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Aug. 10, 1979, Ser. No. 65,502

Claims priority, application Japan, Aug. 12, 1978, 53-98569; Aug. 12, 1978, 53-98570; Aug. 12, 1978, 53-98571; Aug. 12, 1978, 53-98572

Int. Cl.[3] G01J *1/44, 1/42*

U.S. Cl. 356—226 **34 Claims**



1. A light signal observation device comprising; in combination: light receiving means for detecting a light signal; light intermitting means for intercepting or passing therethrough the light signal incident to the light receiving means; amplifying means for amplifying the output from the light receiving means; time base signal generating means for generating a sawtooth wave in synchronism with the light signal passed by the light intermitting means and while the light signal is intercepted and for generating a luminance modulation signal in the period of generation of the sawtooth wave; and display means for displaying a light signal waveform including a 0 level on the basis of the output signal from the amplifying means and the sawtooth wave and the luminance modulation signal from the time base signal generating means.

4,289,400

APPARATUS FOR MEASURING A GRADIENT OF A SURFACE

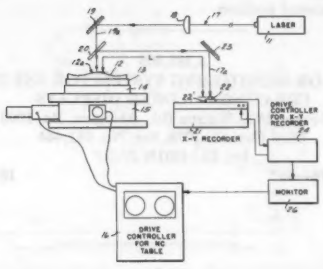
Shigeo Kubota; Tadao Ishihara, and Masahiro Kikuchi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 882,230, Feb. 28, 1978. This application Feb. 7, 1980, Ser. No. 119,354

Claims priority, application Japan, Mar. 8, 1977, 52-137

Int. Cl.³ G01B *11/24, 11/26*

U.S. Cl. 356—376 **7 Claims**



1. Apparatus for determining the gradient at different points on the surface of an optical lens comprising, an NC table having a deck for supporting said lens, said deck being mounted for movement in one plane, a drive and controller therefor for moving said deck of said table in said plane, a light detector, a recorder having a deck upon which said light detector is mounted, said recorder having means to record the position of said recorder deck in X and Y coordinates, means for producing a beam of light and directing it normal to said deck toward a point on a surface of said corrective lens whose gradient is to be measured, a half mirror mounted at 45 degrees to the path of said light beam and said beam passing therethrough, a second mirror mounted at 90 degrees to said half mirror and laterally offset therefrom, said beam being reflected from said surface of said lens back to said half mirror where it is deflected to said second mirror and then again deflected to form a spot on said light detector, said recorder including means for moving said light detector until the center of said light detector coincides with the center of the deflected beam, said recorder including means to record the X and Y distances which said recorder deck was required to move from reference X and Y positions to bring the center of said light detector into coincidence with the center of said light spot falling on said light detector and including means for generating ΔX and ΔY signals, a value Δl obtained from which signals according to the equation: $\Delta l^2 = X^2 + Y^2$ is proportional to the slopes of the surface of said corrective lens at said selected point in the X and Y directions and a drive controller for causing movement of said deck of said NC table to cause said light beam to strike said lens at a different point on the surface thereof, so that the slope at said different point can be obtained upon movement of said recorder deck to a position where the center of said light spot coincides with said center of said light detector to obtain ΔX and ΔY signals for said different point from which the gradient θ can be determined from the equation $\Delta l = L \tan 2\theta$, where L is the distance which said light beam travels from said lens to said light detector.

4,289,401

OPTICAL SYSTEM FOR SPECTRAL DEVICES

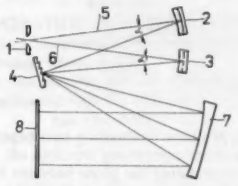
Joachim Mohr, Jena-Lobeda, German Democratic Rep., assignor to Jenoptik Jena GmbH, Jena, Jena, German Democratic Rep.

Filed Dec. 26, 1979, Ser. No. 106,069

Claims priority, application German Democratic Rep., Jan. 3, 1979, 210307

Int. Cl.³ G01J *3/18*

U.S. Cl. 356—305 **1 Claim**



1. An optical system for spectral devices, comprising subsequently in a path of rays and in mutual alignment

at least one light entrance opening,

at least two collimating reflectors for splitting said path of rays,

one dispersing member for the splitted path of rays,

said collimating reflectors being adjacently located in the dispersion direction of said dispersing member and inclinedly arranged relative to each other and at right angles to the dispersion direction, said dispersing member for producing at least two sections of a spectrum in continuation relative to each other,

a camera optics, and

at least one detector arranged in the meridional focal plane of the optical system said camera optics for imaging said sections onto said detector.

4,289,402

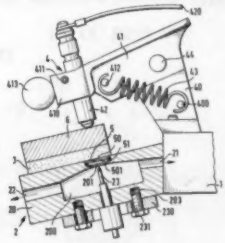
SPARK CHAMBER FOR A VACUUM EMISSION SPECTROMETER

Ehrhardt Teubner, Ingolstadt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Aug. 3, 1979, Ser. No. 63,200

Int. Cl.³ G01J *3/10*

U.S. Cl. 356—313 **7 Claims**



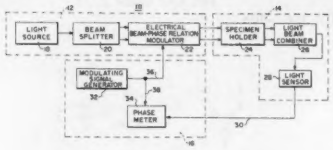
1. A spark chamber for a vacuum emission spectrometer with a housing, which accommodates an anode, as well as a sample table plate carried by the housing, on which the piece of material being inspected and making up the cathode is placed and which carries a spark centering plate, distinguished by the fact that the sample table plate **(5)** includes a moulded laminated material, whose side **(501)** facing the anode **(23)** has a polished surface.

4,289,403

OPTICAL PHASE MODULATION INSTRUMENTS

Robert W. Allington, Lincoln, Nebr., assignor to Isco, Inc., Lincoln, Nebr.

Filed Mar. 4, 1977, Ser. No. 774,527
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—349 **69 Claims**



1. A method of phase modulating two beams of light with respect to each other comprising the steps of:

periodically modulating the phase between first and second beams of light with respect to each other in relationship to a modulating signal at one location;

mixing said first beam of light with said second beam of light at a second location to create an interference pattern;

deriving a second signal that has a time relationship to said interference pattern, whereby said second signal indicates said modulating signal at said second location;

said step of phase modulating including the steps of transmitting said first beam of light through a material capable of passing light along a first path, transmitting said second beam of light through said material along a second path which enters and leaves said material at different locations than said first path and perturbing said material, whereby the differences between the two optical path lengths of said first and second beams of light is varied; and

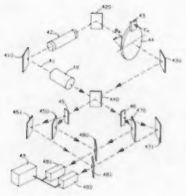
the step of phase modulating further including the step of phase modulating said first and second beams of light with respect to each other by passing at least one of said first and second beams of light through a cell in which the refractive index changes with time in addition to passing said beam of light through said material capable of passing light.

4,289,404

LASER-BASED DEFLECTION MEASURING METHOD AND APPARATUS

Robert M. Kiehn, Luling, Tex., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 27, 1979, Ser. No. 79,286
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—351 **28 Claims**



1. A displacement sensor comprising

a laser including a plurality of reflectors which establish an optical path therebetween, one or more of said reflectors being partially light-transmissive;

a laser amplifier contained within said optical path for generating a laser beam therein;

an optically transmissive means disposed in said path, said optically transmissive means having an optical axis in a normal position parallel to the axis of said laser beam, and said optically transmissive means exhibiting optical anisotropy;

means responsive to an external force to displace said optical axis of said optically transmissive means from said normal position; and

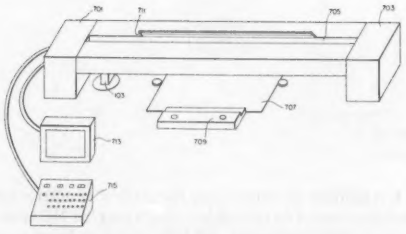
a photosensitive beat detector positioned to intercept radiant energy exiting from said optical path through one or more of said partially light-transmissive reflectors, for detecting one or more difference frequencies between different modes of operation of said laser beam, said one or more difference frequencies resulting from the displacement of said optical axis of said optically transmissive means from said normal position.

4,289,405

COLOR MONITORING SYSTEM FOR USE IN CREATING COLORED DISPLAYS

Philip E. Tobias, 1872 Watson Rd., Abington, Pa. 19001

Filed Oct. 13, 1978, Ser. No. 951,444
Int. Cl.³ G01N *21/27*
U.S. Cl. 356—407 **10 Claims**



1. A method for determining black marker locations for use to determine what colors of a color swatch bar should be read by a scanning head comprising the steps of:

(a) advancing a scanning head over said markers to detect when the color black is read;

(b) storing in a first memory means a number which represents an acceptable width of a black marker;

(c) generating clock pulses which when accumulated represent a value that is commensurate with the distance said scanning head has been advanced;

(d) counting said clock pulses and storing the accumulated value in a second memory means;

(e) storing the count from said second memory means into a third memory means when said scanning head reads the color black;

(f) subtracting the count in said third memory means from the count in said second memory when said head ceases to read the color black;

(g) comparing the difference determined in step (f) with the value in said first memory means and if the difference is less;

(h) storing the value in said third memory means into a fourth memory means indicating that there is a black marker at the location indicated by the value in said fourth memory means.

4,289,406

LIGHT TRANSMISSION MEASUREMENT METHOD

William J. Maddox, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

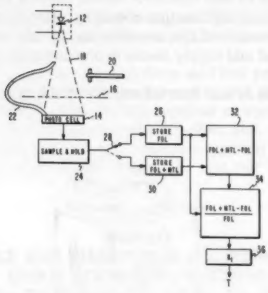
Filed Mar. 9, 1979, Ser. No. 18,909
Int. Cl.³ G01N *21/84, 21/86*
U.S. Cl. 356—429 **2 Claims**

1. In a method for measuring light transmission through a

continuous sheet having a series of separated aperture patterns thereon wherein a light source is positioned on one side of the sheet and a light sensor is positioned on the opposite side of the sheet, the improvement comprising

continuously bypassing a portion of the light from said light source around said sheet to said light sensor,

recording the sensor output when direct light to said sensor is obstructed, recording the sensor output when direct light to said sensor is unobstructed, and dividing the obstructed sensor output by the unobstructed sensor output to obtain a system ratio,



first measuring sensor output when direct light is blocked from said sensor,

second measuring sensor output when an aperture pattern is located between said light source and said sensor,

subtracting the first measured sensor output from the second measured sensor output to obtain an output difference,

dividing the output difference by the first measured sensor output to obtain a normalized value, and

multiplying the normalized value by said system ratio to obtain the transmission ratio of a particular aperture pattern.

4,289,407

METHOD FOR BINDING LIQUID-CONTAINING RADIOACTIVE WASTES AND KNEADING MACHINE THEREFOR

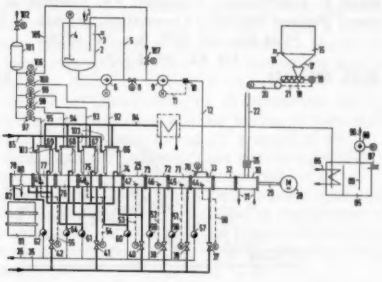
Anwer Puthawala, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Division of Ser. No. 813,476, Jul. 7, 1977, Pat. No. 4,194,842. This application Nov. 14, 1979, Ser. No. 94,197

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1976, 2631326

Int. Cl.³ B29B *1/06*; B01F *15/06*

U.S. Cl. 366—75 **2 Claims**



1. In apparatus for binding liquid-containing radioactive wastes in admixture with a thermoplastic material in a worm press kneading machine having a housing enclosing a worm to mix the wastes and thermoplastic material and heating means to heat the mixture, domes disposed above the housing and connected thereto into which domes vapor from the mixture is released from the housing into the domes, and vapor outlets in the domes, the improvement which comprises an external vessel containing a liquid cleaning agent and lines with control valves connecting the external vessel with the domes in the vicinity of the vapor outlets for the introduction of liquid cleaning agent.

4,289,408

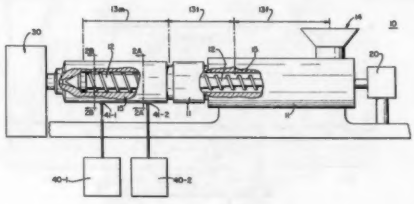
MARBLEIZATION OF PLASTIC MATERIALS

James L. Langlois, Shrewsbury, Mass., assignor to The Gillette Company, Boston, Mass.

Division of Ser. No. 660,008, Feb. 23, 1976, Pat. No. 4,125,582. This application Oct. 31, 1978, Ser. No. 956,243

Int. Cl.³ B29F *1/12*

U.S. Cl. 366—76 **10 Claims**



1. Apparatus for marbleizing molded materials, comprising

a barrel containing an injection screw for feeding the material to be molded;

means for injecting liquid colorant into the feed material where the screw is present;

and means for reciprocating said injection screw to feed the material with said injected colorant and eject the material colorant directly into a mold to produce a marbleized part.

4,289,409

APPARATUS FOR PLASTICIZING AND EXTRUDING PLASTIC MATERIAL

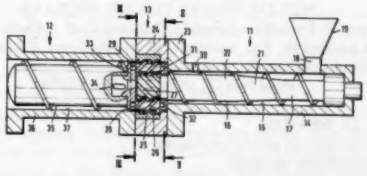
Wilhelm Brand, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 13, 1980, Ser. No. 121,162

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1979, 2906324

Int. Cl.³ B29B *1/10*

U.S. Cl. 366—83 **6 Claims**



1. Multi-stage apparatus for plasticising and extruding plastic materials comprising a first stage and a second stage, a respective rotatable working member for each of said stages, a planetary roller unit having a main spindle and a plurality of planetary spindles, said planetary roller unit being included in said first stage and so drivingly connected to said rotatable working member of said first stage and said rotatable working member

of said second stage, that there is an increase or a reduction in the speed of rotation between said rotatable working member of said first stage and said rotatable working member of said second stage, dependent on the tooth ratio of said planetary roller unit.

4,289,410

WORM FEED EXTRUDER FOR PROCESSING SYNTHETICS, RUBBER AND LIKE MATERIALS

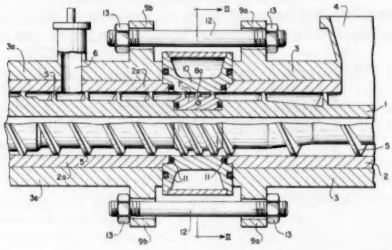
Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover Kleefeld, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 107,046

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856097

Int. Cl.³ B29B *1/10*

U.S. Cl. 366—88 **4 Claims**



1. A worm feed extruder for processing of synthetics, rubber, and like materials, comprising:

a cylinder; and

a feed worm arranged within said cylinder for rotation about a longitudinal axis, said feed worm being divided transversely to said longitudinal axis into a plurality of worm segments, said plurality of worm segments being mounted on a through-bolt extending along said axis;

wherein at least one said worm segment is centrally divided in the direction of said longitudinal axis into worm segment parts, said cylinder is divided transversely to said longitudinal axis into a plurality of cylinder segments, and at least one cylinder segment surrounding and extending the length of said at least one worm segment in the direction of said longitudinal axis is centrally divided in the direction of said longitudinal axis into cylinder segment parts,

whereby said at least one worm segment may be removed from said cylinder without removing all of said plurality of feed worm segments from said cylinder.

4,289,411

MULTILINGUAL INK JET PRINTER

Rorger W. Cornelius; James D. Hill, and Paul A. Quinn, Jr., all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 8, 1979, Ser. No. 92,601

Int. Cl.³ B41J *3/04*

U.S. Cl. 400—126 **27 Claims**

1. An ink jet printer including:

a recording medium;

supply means to supply ink droplets to said recording medium to cause printing of droplets thereon as characters;

first reference means and second reference means spaced from each other along a first axis;

one of said recording medium and said supply means having movement relative to the other along the first axis in either direction;

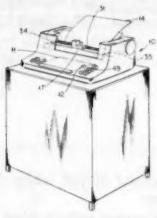
one of said recording medium and said supply means having relative movement with respect to the other along a second axis at an angle to the first axis;

determining means to determine the position of the movable one of said recording medium and said supply means with respect to one of said first reference means and said second reference means at any time and to determine the direction of motion of the movable one of said recording medium and said supply means along the first axis with respect to one of said first reference means and said second reference means;

a plurality of font information holding memories;

at least one of said font information holding memories containing font information requiring printing of characters by movement of the movable one of said recording medium and said supply means in one direction along the first axis;

at least one of said font information holding memories containing font information requiring printing of characters by movement of the movable one of said recording medium and said supply means in the reverse direction to the one direction along the first axis;



selection means to select one of said font information holding memories for character printing;

and means responsive to said selection means to cause said determining means to determine the position and direction of motion of the movable one of said recording medium and said supply means with respect to one of said first reference means and said second reference means when said selection means selects one of said font information holding memories requiring printing of characters in the one direction along the first axis and with respect to the other of said first reference means and said second reference means when said selection means selects one of said font information holding memories requiring printing of characters in the reverse direction along the first axis.

4,289,412

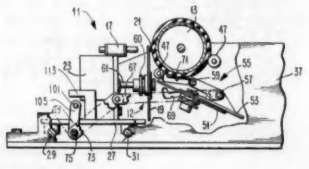
AUTOMATIC TYPEFONT LOADER

William L. Dollenmayer, Versailles, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1979, Ser. No. 98,288

Int. Cl.³ B41J *1/32*

U.S. Cl. 400—171 **12 Claims**



1. Typefont changing apparatus and a printer comprising:

a platen for retaining a print receiving medium;

a print carrier;

positioning means for positioning said print carrier along the length of the platen to discrete printing positions;

a typefont carrying means located on said print carrier and positionable therewith for holding a typefont and for selectively presenting a preselected typeface on the held typefont to impact a document located on said platen at a printing position;

an elongated rack oriented along the length of said platen and positionable from a first position below the platen to a second loading position;

a plurality of typefont picker holder means carried by said rack along the length thereof for storing at least one typefont;

said positioning means positioning said print carrier to align said typefont carrying means adjacent a selected picker holder means;

means for elevating said rack from said first position to said second loading position for presenting said plural typefont picker holder means to said typefont carrying means for presentation or retrieval of a typefont; and,

means for effecting the exchange of a typefont between said selected picker holder means and said typefont carrying means.

4,289,413

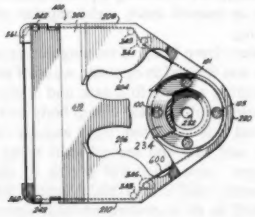
CARTRIDGE AND RIBBON FOR USE WITH A SINGLE SPOOL STENOTYPE MACHINE

Stanley Seplin, 720 Rivergate Plz., Miami, Fla. 33331

Filed Jan. 19, 1979, Ser. No. 4,730

Int. Cl.³ B41J *33/10*

U.S. Cl. 400—196 **3 Claims**



1. For use in combination with a stenograph machine having a recess of predetermined size and configuration opening upwardly and including a drive gear extending into the recess, said recess as seen in plan defining an impact plane in said recess,

a ribbon cartridge having a front and rear and said cartridge being sized and configured to be received in the recess with said front at said plane, said cartridge comprising a generally horizontally disposed shield, said shield including a downwardly extending annular skirt having a lower outturned distal end spaced from said shield a predetermined distance, a spool of an axial dimension less than said predetermined distance sized to be received and journaled about said skirt and supported on said lower outturned distal end, said spool including an annular ink pad rotatable with said spool and said pad having an outer surface and comprising means to soak up a supply of ink,

said skirt, spool and pad being sized and arranged with said outer surface being adjacent the cartridge rear,

said spool having a downwardly facing annular gear surface sized and arranged for companionate engagement with the drive gear when the cartridge is in the recess adapting the spool for rotation about the skirt when the drive gear turns;

guide means extending from the shield comprising spaced downwardly extending guide pins and defining a ribbon path about the pins and outer surface of said pad on said spool,

a taut loop form ribbon disposed about said pad and in engagement with said outer surface of said pad, said ribbon having an inside surface and an outside surface and being of a width less than said predetermined distance and said inside surface being at all times in engagement with said ink pad for movement along said path when said spool is rotated and with a portion of the outside ribbon surface at all times being at said plane,

said spool having an access opening means facing upwardly for charging ink through said opening means onto said pad to be soaked into said pad.

4,289,414

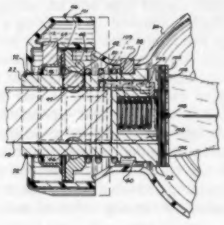
TORQUE TRANSMITTING COUPLING

Florian B. Recker, 802 First St., Dyersville, Iowa 52040

Filed Dec. 6, 1979, Ser. No. 100,826

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—12 **10 Claims**



1. A torque transmitting coupling comprising:

a housing;

an opening in said housing, a portion of said opening being non-circular, said opening being adapted to receive a non-circular portion of a shaft;

means for selectively locking the non-circular portion of said shaft into the opening in said housing, said locking means being biased to a locked position and selectively movable to an unlocked position;

said locking means comprising a plurality of bores radially disposed in said housing and a recess in said shaft, a locking element slidably disposed in each of said bores and radially movable from an inner, locking position, wherein the elements are engageable within the recess of said shaft to thereby prevent relative axial movement of the housing with respect to the shaft and an outer, unlocked position, whereby the elements permit relative axial movement of the housing and the shaft, an annular cam means slidably disposed around said housing and being axially movable between a first position holding the locking elements in their locking position and a second position allowing the locking elements to move to their unlocked position and means for biasing said cam means to said first position;

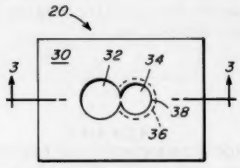
guard means rotatably disposed around said housing for preventing human contact with said housing when the housing is locked onto said shaft;

adjusting means attached to said guard means and around said housing and disposed between the housing and the guard means for selectively moving said cam means from the first to the second position thereof, said adjusting means having a plurality of depressions around the periphery thereof for contacting said locking elements when said locking elements are in the unlocked position thereof, whereby rotation of the guard means causes rotation of the adjusting means which causes rotation of said housing and whereby the opening in the housing can be aligned with the shaft for placing the housing over the shaft.

4,289,415
ADJUSTABLE COUPLING DEVICE

Lawrence W. Fishinger, Denville, N.J., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 21, 1980, Ser. No. 151,992
Int. Cl.³ F16B 7/10
U.S. Cl. 403—104 **13 Claims**



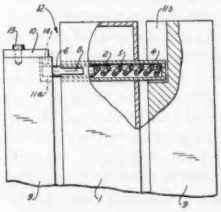
1. An adjustable coupling device comprising:

a single-piece rigid body including an unthreaded first hole therethrough of a diameter adapted to provide clearance for a first threaded rod of a predetermined diameter and a predetermined thread type and including a threaded second hole which is adapted for engaging a second threaded rod of said predetermined diameter and said predetermined thread type, said threaded second hole having a minor thread diameter which is tangent to said first hole and having an axis parallel to an axis of said first hole, whereby, when said first and second threaded rods are inserted into said first and second holes, respectively, of said adjustable coupling device, the threads of said first rod engage the threads of said second rod, said device thereby providing between said rods a coupling which can be adjusted by turning either of said rods.

4,289,416
ARRANGEMENT FOR MOUNTING AND DISMOUNTING PIVOTED LEVERS IN TOOL HOUSINGS

Hans J. Birr, Wuppertal, and Paul-Ulrich Uibel, Ennepetal, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,829
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 7906701[U]
Int. Cl.³ F16C 11/06
U.S. Cl. 403—146 **3 Claims**

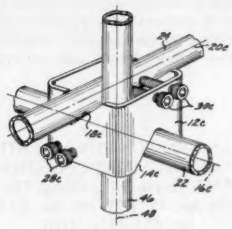


1. An arrangement for mounting and dismounting pivoted lever assemblies in tool housings, comprising a lever having two opposite lateral sides and including a projection integrally formed therewith and extending transversely therefrom, a tool housing having a recess to receive said lever and formed with two oppositely positioned elongated grooves each facing the respective opposite side of said lever, said projection being formed with an elongated blind bore having a closed end formed by said projection and extending into one of said grooves and an open end diametrically opposite to said closed end; an axle journal inserted into said open end and projecting therefrom into a second of said elongated grooves, said axle journal being adapted to move within said blind bore between a first position engaging said second groove and a second position being disengaged from said second groove; a spring mounted within said blind bore and having one end supported in said closed end of said blind bore and another end abutting said axle journal; and a sheet metal holder secured to the tool housing above said second groove for preventing an upward movement of said axle journal in said first position.

4,289,417
CLAMP

Kenneth H. Mandell, 19 Pomona Ave., Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 64,038, Aug. 6, 1979, abandoned. This application May 5, 1980, Ser. No. 146,446
Int. Cl.³ F16D 1/00
U.S. Cl. 403—218 **3 Claims**



1. A clamp for mounting a plurality of elongated structural elements in spaced apart, right angular relation, said clamp comprising:

a tubular clamp body of rectangular cross section having a first seat formed in opposite walls of said clamp body and extending along a first axis, and a second seat formed in opposite walls of said clamp body and extending along a second axis in spaced, right angular relation to said first axis, said first and second seats being laterally open for receipt, respectively, of a pair of elongated structural elements, said clamp body further having a third seat defined by an inner corner of said clamp body and extending along a third axis in spaced, right angular relation to said first and second axes, said clamp body including openings opposite said first, second and third seats for receiving clamping means respectively, for engagement with said structural elements, respectively, for urging said structural elements against said seats.

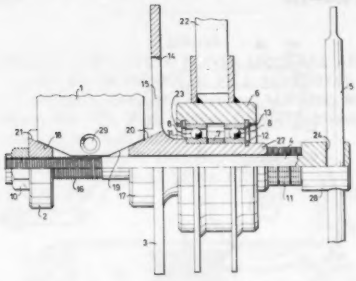
4,289,418
DEVICE FOR SECURING AN EXPANDABLE HUB IN A HOLE

Owe Westin; Oswald Westin, and Jan Westin, all of Föreningsgatan 11, 951 43 Lulea, Sweden

Filed Jul. 30, 1979, Ser. No. 61,627
Claims priority, application Sweden, Aug. 11, 1978, 7808581
Int. Cl.³ F16B 2/00, 7/04
U.S. Cl. 403—369 **6 Claims**

1. In a device for securing an expandable hub in a hole, particularly, but not exclusively, the hub of a cable drum wheel in the center hole in the side of a cable drum, comprising a hub having projecting in an axial direction a part which is intended to be inserted into a hole and expanded there to bear against the walls of the hole, said part consisting of a number of radially movable tightening jaws, which are actuated by a bracing block which is operated by the effect of force, said block being provided with a number of slots corresponding to the number of jaws, said slots having an inclined guide surface, which surface acts upon a corresponding guide surface on one end of the interacting jaw in conjunction with the radial displacement of the jaw when the block is operated, both the jaws and the

block remaining unrotatable when operated, said force being applied to said bracing block to force said bracing block against said tightening jaws, the improvement consisting of a second inclined guide surface at the opposite end of each of said interacting jaws, arranged to interact with a complementary guide surface at the radially inner end of a radial oblong slot in a guide plate attached to said hub, said jaw in radial and



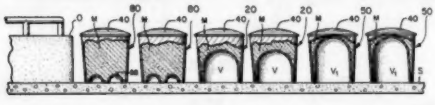
axial movement being unrotatably guided in said oblong slot, said bracing block being operated by means of a shaft running through said hub, which said plate permits an improved centering of the device when said device is inserted into the hole, said jaws having a traverse hole, and an expandable means connected through said holes whereby said jaws are radially directed against said shaft.

4,289,419

INERTIAL BARRIER SYSTEM

Bruce O. Young, and Wan Seegmiller, both of Sacramento, Calif., assignors to Energy Absorption Systems, Inc., Chicago, Ill.

Filed Oct. 1, 1979, Ser. No. 80,766
Int. Cl.³ E01F *15/00*
U.S. Cl. 404—6 **13 Claims**



10. An inertial barrier system for attenuating the energy of errant vehicles comprising:

a plurality of module means arranged in a selected array adjacent a hazard in the path of travel of a vehicle, each of said module means including a frangible container having a generally inverted U-shaped configuration with an opened and enlarged upper portion having a relatively large volume and a lower portion having a relatively small volume so that each container is adapted to receive a continuous mass of dispersible energy-attenuating material and to maintain the center of gravity of said mass above said lower portion, the lower portion of each of said containers further defining a central void of substantial volume for receiving a portion of the dispersing energy-attenuating material upon the initial impact of the errant vehicle against the frangible containers; and

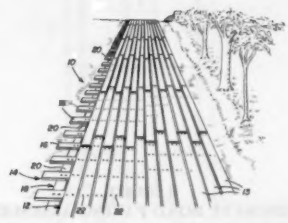
means to cover said opened portion of each container.

4,289,420

WOODEN MAT

Marvin L. Davis; Edd C. Davis, and Albert R. Green, all of Rte. 1, Box 66, Shubuta, Miss. 39360

Filed Jun. 6, 1979, Ser. No. 45,929
Int. Cl.³ E01C *5/14*
U.S. Cl. 404—35 **5 Claims**



1. A wooden mat for use in forming a temporary roadway for supporting vehicles, or the like, said mat comprising:

surface layer means directly abuttable with said vehicles, or the like, which may be positioned on said roadway, said surface layer means including a first set of longitudinally-extending, parallelly aligned wooden planks, said first set of planks lying substantially in the same plane and being in a spaced apart relationship to one another which defines a first space therebetween, said first set of planks being substantially formed of planks having equal lengths and being staggered longitudinally with respect to one another whereby the respective ends of planks in said first set of planks do not all lie in the same plane;

intermediate layer means positionable below said surface layer means and being fixedly attached thereto, said intermediate layer means including a second set of planks lying substantially in the same plane and being in a spaced apart relationship to one another which defines a second space therebetween, said second space being utilizable to position planks associated with transversely-located adjacent wooden mats therein in an interdigitated manner which results in an interlocking of said transversely-located adjacent wooden mats to thus prevent relative longitudinal movement therebetween, an offset positioning so as to provide staggered lap joints for increased stability, and a horizontal extension in width of said roadway, said second set of planks being formed substantially of planks having equal lengths and having their respective ends lying in the same plane, said second set of planks being substantially orthogonally positioned with respect to said first set of planks;

end plank means lying in the same plane as said second set of planks and being in parallel, spaced apart alignment therewith, said end plank means comprising a plank having at least one end thereof lying in the same plane as a respective set of ends of said second set of planks and further being directly fixedly connectible to said surface layer means;

lower layer means positionable below said intermediate layer means and being fixedly attached thereto, said lower layer means including a third set of planks lying substantially in the same plane and being in a spaced apart relationship to one another which defines a third space therebetween, said third set of planks being formed substantially of planks having equal lengths and having their respective ends lying in the same plane, said third set of planks being substantially orthogonally positioned with respect to said second set of planks; and

short segment means fixedly attached to said lower layer means and orthogonally positioned relative thereto, said short segment means lying in the same plane as said second set of planks and being in parallel alignment therewith, said short segment means being positionable in an

interdigitated manner between an end plank means and an intermediate layer means of a longitudinally-located adjacent wooden mat to effect both a longitudinal extension of said roadway and an interlocking of said longitudinally-located adjacent wooden mats to thus prevent relative longitudinal movement therebetween.

4,289,421

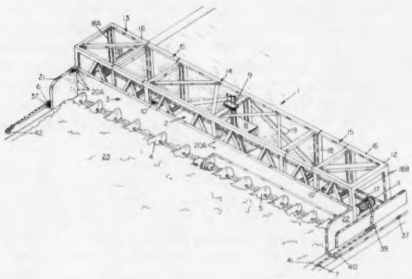
CONCRETE ROAD PAVING ASSEMBLY

William P. Sampey, and Larry A. Sampey, Sr., both of P.O. Box 2893, Morgan City, La. 70380

Filed Jun. 11, 1979, Ser. No. 47,341

Int. Cl.³ E01C *19/12*

U.S. Cl. 404—106 **2 Claims**



1. A lightweight paving machine comprising:

(a) a frame structure comprising multiple modular units ridgedly attached to one another wherein each modular unit comprises upper frame members separated from lower members by vertical frame members attached at their opposite ends to said upper frame member and lower frame members, respectively, said vertical frame members of adjacent modular units being attached to one another;

(b) a screed assembly comprising a frontal strike-off plate attached parallel to a front side of said frame structure and a finishing pan attached to the bottom side of said frame structure, said finishing pan comprising an adjusting assembly to adjust the crown shape formed by said finishing pan, said adjusting assembly comprising a metal bar extending from one end of said frame structure to its other end, said metal bar being positioned above said pan, two rows of threaded bolts attached at one bolt end to said pan and its opposite end passing through openings in said metal bar, one nut screwed into each of said bolts to pull said pan in a desired position, said pan being vertically adjustable on said frame structure at said pan's opposite ends;

(c) an auger attached parallel to said screed assembly and positioned in front of said frontal strike-off plate;

(d) skid guide units attached to each end of said frame structure, each comprising a flat metal plate positioned perpendicularly to said frame structure end and parallel with bottom side of said frame structure;

(e) winches attached to said frame structure; and

(f) vibrators attached to said finishing pan to impart a vibrating motion to said finishing pan.

4,289,422

COMPACTOR

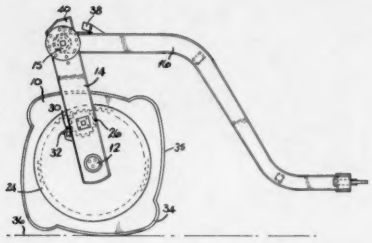
Pieter B. De Klerk, Germiston, and Andries G. Velthuysen, Pretoria, both of South Africa, assignors to Fowler Holdings Limited, Pretoria, South Africa

Filed Sep. 19, 1979, Ser. No. 77,118

Claims priority, application South Africa, Sep. 25, 1978, 77/5437

Int. Cl.³ E01C *19/26*

U.S. Cl. 404—124 **6 Claims**



1. An impact compactor comprising a non-circular roller mounted for rotation about axle means, draft arms positioned on one or both sides of the roller and supporting between them the axle means, said draft arms extending upwardly from the axle means, a draw bar for towing the roller, said draw bar being pivotally connected through at least one torsion bar extending transversely of and above the roller to the draft arms, and a gear and pinion linkage between the roller and the draft arms.

4,289,423

PROTECTIVE SKIRT FOR AN ICEBERG

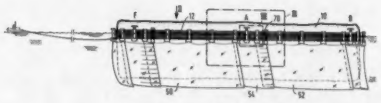
Georges L. Mougin, Paris, France, assignor to I.T.I. Limited, Paris, France

Filed Nov. 20, 1979, Ser. No. 96,037

Claims priority, application United Kingdom, Nov. 22, 1978, 45638/78

Int. Cl.³ E02B *1/00*

U.S. Cl. 405—61 **4 Claims**



1. A protective skirt for a tabular iceberg, the skirt comprising:

a string of floating posts;

an upper protective portion in the form of panels suspended in a vertical plane between adjacent pairs of the floating posts;

a lower protective portion suspended below the floating posts; and

at least one auxiliary float;

at least one of the floating posts including panel-manipulating means for drawing in at least one of the panels suspended therefrom, whereby the length of the string of floating posts may be shortened by shortening the length of at least one of the spans between floating posts;

the lower protective portion being attached to the floating posts in such a way that it is supported by the floating posts for each span of the string of floating posts that is not capable of being shortened by panel-manipulation means;

the lower protective portion including a vertically extending division associated with each floating post that includes

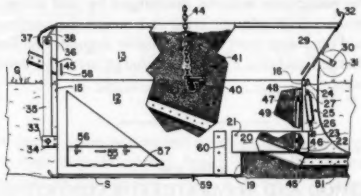
panel-manipulating means, with one edge of the division being supported by one of the floating posts and the other edge of the division being supported by a corresponding auxiliary float, the length of the or each span of the lower protective portion having one end supported by the auxiliary float being such that the edges of the division overlap and the degree of overlap is adjustable by moving the position of the auxiliary float relative to the string of floating posts in order to accomodate shortenings of the length of the string of floats.

4,289,424

APPARATUS FOR LAYING CONDUIT, CABLE AND THE LIKE IN OR BENEATH FILL MATERIAL

Robert J. Shefbuch, Covington, Ohio, and Marvin E. Rue, 4285 W. State, Rte. 571, West Milton,, Ohio 45383, assignors to Marvin E. Rue, West Milton, Ohio

Filed Jan. 7, 1980, Ser. No. 109,899
Int. Cl.[3] F16L *1/02*
U.S. Cl. 405—179 **33 Claims**



1. A device for the rapid laying of an article in a simultaneously deposited layer of embedding material, including a structure having opposite ends, one of which is a leading end and the other a trailing end, said structure containing within the bounds thereof a hopper for holding a supply of embedding material, an article feeding tube extending through the interior of said hopper to have its inlet end located adjacent said leading end of said structure and its output end adjacent said trailing end, means defining an exit opening from said hopper and from said structure for embedding material within said hopper to discharge from said trailing end adjacent said output end of said feeding tube, the output end of said tube extending to and through said exit opening, said tube and said exit opening being arranged at said trailing end to provide that in the movement of said device over a supporting surface there is a continuing deposit on such surface of a layer of embedding material concurrently with a continuing deposit of the article issuing from said tube within or on said layer of discharged embedding material.

4,289,425

UNDERWATER ACCUMULATOR FOR PRESSURIZED GAS

Fumio Ootsu, 6-4, Shirahae-cho, Sasebo-shi, Nagasaki-ken, Japan (857)

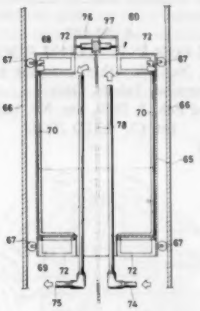
Filed Dec. 1, 1978, Ser. No. 965,610
Claims priority, application Japan, Jun. 16, 1978, 53/72903
Int. Cl.[3] F17C *1/00*
U.S. Cl. 405—210 **9 Claims**

1. An apparatus for accumulating pressurized gas underwater comprising:

a reservoir adapted to be placed underwater for storing pressurized gas, said reservoir having an opening through which water can flow into and out of the reservoir;

an inlet passage and an outlet passage communicating with said reservoir for respectively supplying and discharging the pressurized gas to and from said reservoir;

means cooperable with said reservoir for anchoring the reservoir underwater, comprising a winch mounted on said reservoir, a sprocket driven by said winch, a chain extending around said sprocket for being driven thereby upon actuation of said winch, a weight connected to said chain, means on said reservoir for operating said winch in response to variations in the water head at said reservoir;



a housing adapted to be anchored underwater and a sleeve mounted in said housing, said reservoir being movably supported in said sleeve; and

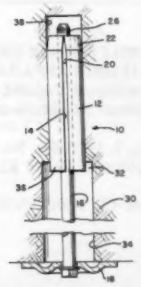
a plurality of rollers rotatably mounted on said reservoir, said rollers being in rolling engagement with said sleeve.

4,289,426

FRICTION ROCK STABILIZER AND METHOD OF FORMING SAME, AND A METHOD OF STABILIZING AN EARTH STRUCTURE

Walter M. Chaiko, Titusville, N.J., assignor to Ingersoll-Rand Company, Princeton, N.J.

Filed Sep. 14, 1979, Ser. No. 75,749
Int. Cl.[3] E21D *21/00, 20/00*
U.S. Cl. 405—259 **7 Claims**



1. A method of stabilizing an earth structure through a given depth thereof with a friction stabilizer having a length of less than said given depth, comprising the steps of:

forming a borehole of a given circumferential dimension and of the given depth in said earth structure;

stabilizing the earth structure along a first length of said given depth and substantially fully about the circumference of said first length by installing a friction stabilizer having a generally tubular body, which is conformable to said given circumferential dimension, and having a length substantially corresponding to said first length, fully into said borehole until it occupies substantially the entirety of said first length and frictionally engages substantially the full circumference of said first length with a given, substantially uniformly-distributed anchoring force; and

stabilizing the earth structure along the remaining length of said given depth by attaching one end of an elongate extension article to the installed stabilizer; and

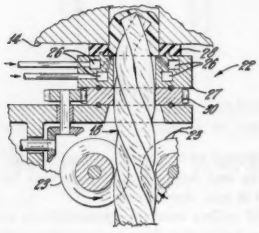
mounting an earth structure retention plate on the opposite end of said article securely against the earth structure, to lend support and stabilization to the remaining length of said depth.

4,289,427

PROCESS FOR INSTALLING ROOF BOLTS

John A. Rolston, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 7, 1979, Ser. No. 10,097
Int. Cl.³ E21D *20/02*
U.S. Cl. 405—260 **10 Claims**



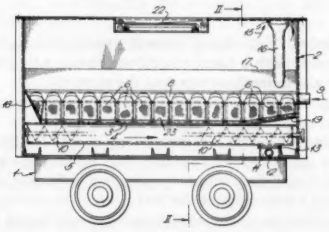
1. A process comprising:
inserting a cable into a hole in a surface of a mine shaft, said cable comprising a plurality of twisted strands wherein a plurality of said strands each have a duct extending from one end of the strand to the other to permit air to escape from the hole;
sealing the entrance of said hole around said cable;
rotating the cable in the direction to tighten the cable during its insertion into said hole and;
simultaneously with the insertion of said cable, injecting a bonding agent into said hole around said cable.

4,289,428

PARTICULATE MATTER AIR ASSISTED SCREW DISCHARGE APPARATUS

Frederick J. Hiorns, Orpington, England, assignor to The Associated Portland Cement Manufacturers Limited, London, England

Filed Aug. 2, 1977, Ser. No. 821,147
Claims priority, application United Kingdom, Aug. 6, 1976, 32849/76
Int. Cl.³ B65G *53/38*
U.S. Cl. 406—39 **11 Claims**



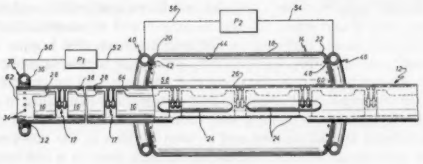
1. A mobile bulk container from which particulate solid matter is adapted to be discharged in a relatively constant manner with a minimum of raised dust comprising a closed container defining a fluidizing chamber within which the particulate matter is admixed with air, said container having a downwardly sloping floor upon which the particulate matter may rest, said sloping floor having a bottom edge terminating adjacent and along a channel, means for directing pressurized air upwardly from said floor to admix with and fluidize at least a portion of the particulate matter, a screw conveyor within said channel into which the particulate matter is collected and conveyed by said screw conveyor toward a discharge end area of said channel within said container, said screw conveyor and said channel being constructed and arranged to provide in conjunction with the collected particulate matter an air seal between the fluidized portion of the particulate matter in said fluidizing chamber and the particulate matter discharged by said screw conveyor at said discharge end area, conduit means leading from adjacent a top of said fluidizing chamber and opening into said discharge end area within said container for refluidizing the discharged solid matter at said discharge end area, a discharge opening placing said discharge area into fluid communication with atmosphere through which the refluidized particulate matter is discharged to atmosphere in the relative absence of raised dust due to the air seal between said fluidizing chamber and said discharge area, a discharge port between said discharge area and said conduit means through which the particulate material discharged by said screw conveyor enters said discharge area, and means for varying the size of said discharge port to controllably regulate the flow of the discharged material into the discharge area and hence to atmosphere.

4,289,429

METHOD AND APPARATUS FOR CONVEYING MATERIAL IN PIPELINE CAPSULES

Alexander I. Kalina, 12439 Millbanks, Houston, Tex. 77031

Continuation-in-part of Ser. No. 925,514, Jul. 17, 1978, abandoned. This application Aug. 31, 1979, Ser. No. 71,178
Int. Cl.³ B65G *51/36*
U.S. Cl. 406—105 **16 Claims**

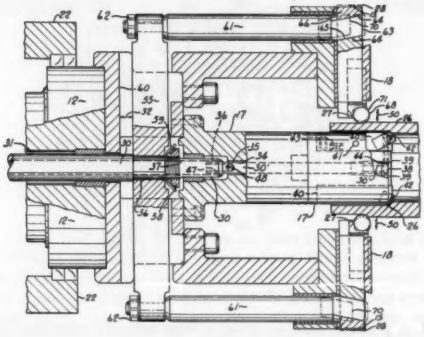


8. A pipeline capsule transportation apparatus for transporting capsules in a linked train, the apparatus comprising;
(a) an elongated pipeline having an upstream pipeline location and a downstream pipeline location remote from the upstream location;
(b) an energy transfer station downstream of the downstream pipeline location, the transfer station comprising an elongated enclosure which is associated with a length of pipeline and is in fluid communication with the length of the pipeline, the enclosure having a cross-sectional area larger than that of the pipeline;
(c) station pump means for withdrawing fluid from a downstream location of the station and pumping the fluid into an upstream location of the station to provide downstream fluid flow along the enclosure for propelling capsules passing through the length of pipeline in the enclosure; and
(d) control means for controlling the velocity of fluid between the upstream and downstream pipeline locations during use by exhausting fluid from the pipeline for the pressure to be less at the upstream pipeline location than at the downstream pipeline location, and for the pressure to increase in the pipeline from the upstream pipeline location to the downstream pipeline location.

4,289,430
METHOD AND APPARATUS FOR SIMULTANEOUSLY BORING AND TURNING UPSET PIPE END

Alex Shashaty, Leetonia, Ohio, assignor to Fairfield Machine Company, Columbiana, Ohio

Filed Mar. 14, 1979, Ser. No. 20,366
Int. Cl.[3] B23B *35/00, 51/08*
U.S. Cl. 408—1 R 8 Claims



1. A combination boring and turning machine for upset pipe ends comprising, a support frame, a spindle journaled for rotation on its axis in said frame, a motor in rotary driving engagement with said spindle, a pipe end inside boring head axially aligned with and secured to one end of said spindle, a pipe end outside turning head secured to said one end of said spindle and coaxially positioned over said boring head for clearance therebetween to coaxially receive a pipe end for simultaneous boring and turning said boring head having a plurality of circumferentially spaced pipe end boring tools and said turning head having a plurality of circumferentially spaced pipe end turning tools respectively, and means to retract said boring tools radially inward out of boring engagement with a pipe end and to retract said turning tools radially outward out of turning engagement with the same pipe end simultaneously.

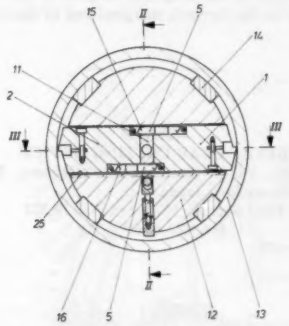
6. A method of simultaneously boring and turning an upset pipe end comprising the steps of, clamping a pipe in axial alignment with an axially rotating combination ID-OD pipe end boring-turning head having respective ID and OD cutters in preparation for boring and turning an upset end of the pipe, axially engaging said rotating combination head and said pipe end and thereby simultaneously boring and turning a portion of said upset pipe end, thereafter simultaneously retracting the ID cutters radially inward and the OD cutters radially outward out of engagement with said pipe end, and then axially separating said combination head and said pipe end.

4,289,431
BORING TOOL WITH FLOATING BLADES

Garrj Berstein, Erkelenz, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Continuation of Ser. No. 904,552, May 10, 1978, abandoned.
This application Feb. 28, 1980, Ser. No. 126,852
Claims priority, application Fed. Rep. of Germany, May 25, 1977, 2723622
Int. Cl.[3] B23B *51/00, 39/06*
U.S. Cl. 408—154 18 Claims

1. In a bearing tool, a combination comprising a tool head having an axis and being provided with a slot extending transverse to said axis; a pair of opposite cutting knives floatably mounted in said slot movable away from each other to a cutting position and toward each other to an inactive position, each of said cutting knives having an other cutting edge and an inner end face opposite a corresponding end face of the other cutting knife; biasing means cooperating with said cutting knives for biasing the same toward each other to said inactive position; spacer means having a pair of opposite faces and a face extending transverse to said opposite faces, said spacer means being movable in said tool head between two positions in one of which said opposite faces respectively engage said inner end faces of said cutting knives to hold the latter in said cutting position in which said cutting edges of said knives are spaced a fixed predetermined distance from each other and in

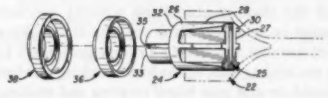


another of which said spacer means permit said cutting knives to move toward each other to said inactive position under the influence of said biasing means; stop means arranged for engagement with the transverse face of said spacer means in said one position of the latter; and means for moving said spacer means between said one position in which said transverse face of said spacer means engages said stop means to thereby hold said cutting knives in said cutting position, and said other position in which said spacer means permits said cutting knives to move said inactive position.

4,289,432
FLAT WOOD BIT ADAPTER

Johnny C. Elkins, 120 W. 4th St., and Marvin C. Hanz, 423 S. Irving, both of San Angelo, Tex. 76901

Filed Aug. 13, 1979, Ser. No. 66,491
Int. Cl.[3] B23B *51/00*
U.S. Cl. 408—201 7 Claims



6. In a flat wood bit having opposed cutting edges positioned rearwardly of a centrally located pilot bit so that the bit can be used for boring holes through a workpiece, the combination with said wood bit of an adapter for enlarging a hole previously bored into the workpiece;

said adapter having a cylindrical body of a diameter to be slidably received in close tolerance relationship within the previously bored hole of the workpiece; said body includes a forward end and a rear end;

a cavity formed centrally within said circular body for receiving the pilot bit of the wood bit therewithin; spaced upstanding keepers arranged adjacent to one another and having one end affixed to and another end extending from said rear end, said keepers each include a flat face on the nearest adjacent slide thereof;

said keepers being positioned in equally spaced relationship respective to the center of said rear end, with said cavity being located equidistance therebetween;

said keepers have outermost faces tapered towards one another in a rearward direction so that the keepers are each reduced in thickness towards said another end;

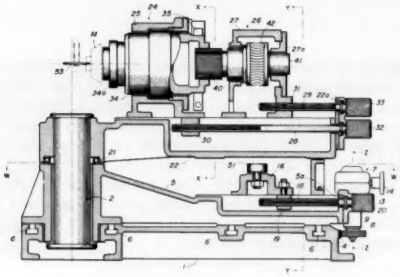
the space between said keepers being smaller than the thickness of the wood bit so that the keepers must be sprung slightly apart when the wood bit is received therebetween, thereby enabling the adapter to be removably attached to the forward, marginal end of the wood bit.

4,289,433

BEVEL GEAR CUTTING DEVICE

Toshizo Inoue, 1-6-46 Kamitakamaru 1-chome, Tarumi-ku, Kobe-shi, Hyogo-ken, Japan

Filed Sep. 27, 1979, Ser. No. 79,313
Int. Cl.³ B23F 5/20
U.S. Cl. 409—29 **5 Claims**



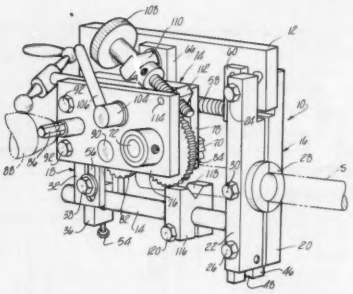
1. A bevel gear cutting device comprising a stationary machine base, a support shaft extending uprightly from said machine base, a table support member mounted at one end on said support shaft for rotation about the axis of the shaft and adjustable with respect to said machine base in alignment with the generatrix of a bevel gear blank, a holding table adjustably supported on said table support member having a rotor, a gear blank rotating and rocking mechanism support member mounted at one end on said support shaft for rotation about the axis of the shaft, a gear blank rotating mechanism slidably supported on said gear blank rotating and rocking mechanism support member and having a rotary gear blank holding member at the leading end, a gear blank rocking mechanism slidably supported on said gear blank rotating and rocking mechanism support member, a main shaft extending through said gear blank rotating mechanism and keyed to said gear blank rocking mechanism, means to rotate said gear blank rocking mechanism at a rate greater than the rotational rate of said main shaft by the number of teeth to be formed on said gear blank and including a cam plate cooperable with said rotor, adjustment means acting on said gear blank rotating mechanism to position the virtual apex of the cone shape of said gear blank on an extension of the axis of said support shaft, means for biasing said cam plate towards said rotor on the holding table, and a high speed cutter movable along the generatrix of said gear blank cone at a low speed in the same plane as the rocking plane of the axis of the cone shape of said gear blank so as to reciprocally move the cutting edge of the cutter between a position just above the conical surface of the gear blank to the deddendum to thereby cut teeth on the gear blank in conformity with the leading curved face of said cam plate.

4,289,434

PORTABLE KEY SEAT CUTTER FOR SHAFTS

Bert W. Piper, 36051 Goddard Rd., Romulus, Mich. 48174, assignor to Bert William Piper, Belleville, Mich.

Filed Sep. 24, 1979, Ser. No. 78,500
Int. Cl.³ B23C 3/30
U.S. Cl. 409—177 **5 Claims**



1. A portable tool for cutting a longitudinally extending key seat in a work shaft comprising, a generally rectangularly shaped, main support frame having spaced front and rear upright end bars, a lower support bar extending between and connecting the lower ends of the end bars and an upper guide bar extending between and connecting the upper ends of the end bars, said guide bar forming a rectilinear guideway between said end bars, said front end bar having an opening therein above the support bar through which the free end portion of a work shaft is adapted to be extended, means for clamping said work shaft in said opening, an upright support block mounted on said support bar and adjustable lengthwise thereof, said support block being adapted to engage and support a portion of the work shaft extending through said opening and cooperating with said front end bar for rigidly mounting the frame in a fixed position on a work shaft such that the guideway extends lengthwise of and above the shaft on which the frame is clamped, a slide mounted for rectilinear movement on said guideway, a manually rotatable lead screw extending between said end bars and parallel to said guideway, said lead screw being connected with said slide to shift the slide lengthwise of the guideway when the screw is rotated, a carriage supported on said slide for movement therewith and pivotable thereon about a horizontal axis perpendicular to the path of travel of the slide toward and away from the shaft on which the frame is mounted, means for pivoting the carriage in a vertical plane about said axis on the slide, a drive train on said carriage having an input shaft, a horizontally extending output shaft and gears interconnecting said shafts, said input shaft comprising a stub shaft adapted to be connected with the chuck of a hand-held, power driven drill, said output shaft being journalled on said carriage adjacent the front end thereof and having a rotary key seat cutter mounted thereon for rotation in the axial plane of the work shaft on which the frame is mounted, said output shaft being spaced radially from and forwardly of the pivot axis of the carriage on the slide so that the key seat cutter is displaced in a vertical plane toward and away from the axis of the work shaft in response to pivotal movement of the carriage, said drive train being driven by said input shaft and being free of a driving connection with the lead screw so that rotation of the cutter is independent of its adjustment lengthwise of the shaft, whereby, when the input shaft is connected to the rotating chuck of a hand-held drill, the cutter can be fed radially into the work shaft to cut an arcuate slot therein and can then be advanced lengthwise of the frame by rotating said lead screw to cut a key slot lengthwise of the shaft to the free end thereof.

4,289,435
AUTOMATIC BALE WAGON

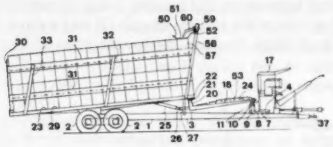
Jean-Claude A. E. Boirin, Pontailler sur Saone, and Jean-Pierre Guenon, Plombieres-lez-Dijon, both of France, assignors to Sperry Corporation, New Holland, Pa.

Filed Aug. 9, 1979, Ser. No. 65,023

Claims priority, application United Kingdom, Aug. 16, 1978, 33512/78

Int. Cl.[3] **A01D** *87/12;* **B65G** *57/32*

U.S. Cl. 414—39 **7 Claims**



1. In a bale wagon for picking up bales lying in a field and forming a stack thereof having a mobile chassis adapted for movement across the field: a bale pick-up means mounted on the chassis for picking up bales from the ground during movement of the bale wagon across the field; a bale transfer table mounted on the chassis for receiving bales picked up from the ground and forming a tier of bales thereon, said bale transfer table having a rearward edge and a forward edge spaced forwardly of said rearward edge, said forward and rearward edges defining a length for said bale transfer table; and a load bed mounted on said chassis rearward of said bale transfer table adjacent said rearward edge for supporting a stack of bales formed thereon by a plurality of generally upright tiers of bales, each upright tier of bales including a plurality of bales arranged in a generally vertical configuration and having a front face directed toward said bale transfer table, said bale transfer table being moveable between a bale receiving position in which said tier of bales is formed in a generally horizontal position with said front face downwardly against said bale transfer table and a generally vertical bale unloading position in which said tier of bales is transferred to said load bed in said vertical configuration to form said stack of bales, an improved bale transfer table comprising:

a generally curved load surface extending along substantially the entire length of said bale transfer table, said tier of bales being formed on said curved load surface with said front face in contact therewith when said bale transfer table is in said bale receiving position, said load surface being curved generally upwardly when said bale transfer table is in said bale receiving position, such that when said tier of bales is moved onto said load bed in said upright position by said bale transfer table said front face of said upright tier of bales is generally concave in shape.

4,289,436
DELIVERY TRAY RELEASE MECHANISM FOR A BALE WAGON

Randall E. Zipser, Clovis, and H. Berton Stringfellow, Fresno, both of Calif., assignors to Sperry Corporation, New Holland, Pa.

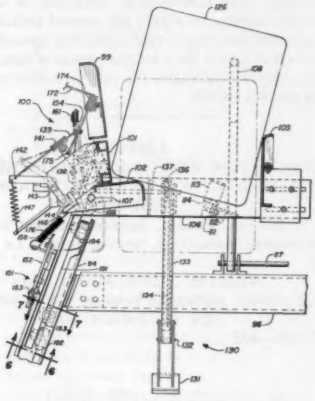
Filed Aug. 8, 1979, Ser. No. 64,929

Int. Cl.[3] **B65G** *57/03*

U.S. Cl. 414—76 **4 Claims**

1. In an apparatus for stacking articles on a surface, said apparatus including a tray with a normally generally horizontal pivotal article-supporting bottom member having a latching surface thereon, a support means supporting said tray above said surface for movement between a loading position where articles are positioned on said tray and a delivery position closer to said surface where articles are deposited, and means to release said bottom member of said tray for pivotal movement and delivery of the articles, the improvement wherein said means to release comprises:

latch means affixed to said tray for pivotal movement between a latched position wherein said bottom member is held in a generally horizontal position and an unlatched position wherein said bottom member is free to pivot and deliver the articles, a roller arm having a first end and an opposing second end, said first end pivotably affixed to said tray back, and said second end supporting a roller whereby said roller may selectively move into and out of



engagement with said latching surface on said bottom member to effect latching or unlatching;

a trip foot affixed to said tray and extending therebelow between said tray and said surface; and

linkage means interconnecting said trip foot and said latch means so that said latch means is moved to said unlatched position when said trip foot engages said surface, said linkage means including resilient means interconnecting said trip foot and said roller arm such that activation of said trip foot moves said roller arm and roller to the unlatched position.

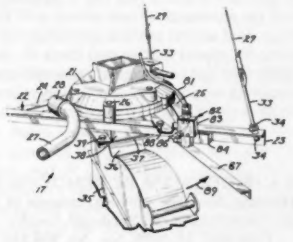
4,289,437
SILO UNLOADER LOWERING CONTROL

Glen D. Hansen, Maple Plain, Minn., assignor to Veda, Inc., Long Lake, Minn.

Filed Jan. 12, 1979, Ser. No. 3,014

Int. Cl.[3] **B65G** *65/38*

U.S. Cl. 414—315 **10 Claims**



1. In a silo unloader operable to remove material from a tower silo, said unloader having a material collector and means for discharging material therefrom, said silo unloader including a portion rotatable within the silo and means for rotating the same, winch means having an electric motor, a cable con-

necting the winch means and silo unloader, means suspending the cable from the upper portion of the silo whereby upon operation of the motor the silo unloader is vertically moved in the silo, and control means electrically connected to the electric motor for controlling its operation and thereby the vertical position of the silo unloader in the silo,

the improvment wherein said control means includes a control switch non-rotatably mounted with respect to the silo unloader,

said switch having an actuator disposed in the path of and operably engagable by the rotatable portion of the silo unloader once during each revolution of said rotatable portion thereby to trigger the control switch,

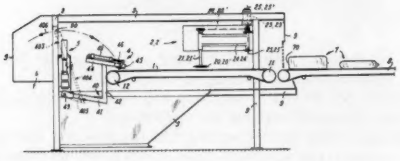
and means connected to said switch for operating said electric winch motor for a limited period of time to lower the silo unloader each time the said switch actuator triggers the control switch.

4,289,438

MACHINE FOR MECHANICALLY OPENING AND EMPTYING BAGS WHICH MAY CONTAIN A TOXIC PRODUCT

Mario V. Murer, Maurage, Belgium, assignor to Ateliers de Constructions Mecaniques Armand Colinet, Le Roeulx, Belgium

Filed Feb. 5, 1979, Ser. No. 9,719
Claims priority, application Belgium, Feb. 6, 1978, 0184
Int. Cl.³ B65G *65/04*
U.S. Cl. 414—412 **5 Claims**



1. A machine for mechanically opening and emptying bags which may contain a toxic product, comprising:

(a) a conveyor arranged to bring bags placed on it to a hopper for collecting the products contained in the bags,

(b) severing means adapted for severing the front face and the two lateral faces of a bag carried by the conveyor during the advancement of the latter, without severing totally the back face of the bag, and

(c) pivoting arms disposed for pivotal movement about a fixed axis, said pivotal arms having a gripping means affixed thereto, said pivotal arms being movable between a first position wherein said gripping means grips a top portion of said severed bag when said bag is full, and a second position wherein said bag is detached after being emptied, the movement of said pivotal arms from said first position to said second position spreading said severed bag to an amount approximating two times the length of said bag, while said bag is supported upon said conveyor, said bag remaining supported by said conveyor as the products contained in said bag are emptied into said hopper.

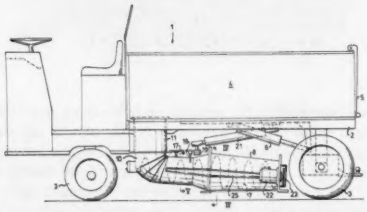
4,289,439

VEHICLE CARRIED MANURE REMOVING MACHINE

Bengt O. Hansson, Norrtälje, Sweden, assignor to Aktiebolaget Sundsvalls Specialprodukter, Sundsvall, Sweden

Filed Oct. 25, 1978, Ser. No. 954,538
Claims priority, application Sweden, Oct. 25, 1977, 7712018
Int. Cl.³ B60P *1/40*
U.S. Cl. 414—523 **7 Claims**

1. A manure removing machine carried by a vehicle and having a mechanically drived feeder screw for taking up manure and other waste material and similar, characterized in that the machine includes an elongated substantially horizontal casing (8) around the feeder screw (7) and said casing (8) has receiving mouth (9) axially disposed in the substantially horizontal section of said casing (8) an outlet end of the casing (8) is connected to a tube (10) directed substantially vertically upwards and guided in a tube socket (11) fixably mounted on said vehicle, and the upper end of the said tube socket (11) being brought to communicate with a collection box (4) carried by said vehicle, and that said feeder screw (7) and the casing (8) are together positively rotatable outward from under said vehicle about said tube (10) in a substantially horizontal plane and said feeder screw (7) and casing (8) are raised and lowered between an end position being substantially in the longitudinal axis of the vehicle chassis (2) and a short distance above a level plane through the lowest point of the vehicle



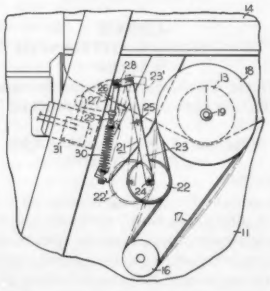
wheels (3) and a second end position in which an outer longitudinal portion of the feeder screw (7) and the casing (8) is located outside of the vertical plane through the wheels of the vehicle on the same side as the screw and casing and with the lower side of the casing (8) substantially on the same level as the plane through the lowest point of the wheels (3) further characterized in that a horizontal level arm (17) extends radially out from the tube (10) wherein said lever arm is connected to the casing (8) by a bar (18), and the outer end of the lever arm (17) is supported by a guide bar (19), which is fixably mounted in the chassis of the vehicle and is bow formed and which guide bar (19) slopes from a high point fastened with means connected to said vehicle chassis and disposed under the central portion of the vehicle, lowers somewhat at a second end to a low point aside of the said vehicle.

4,289,440

MECHANISM FOR PREVENTING OPERATION OF A BIN UNLOADING AUGER WHEN OUT OF ITS UNLOADING POSITION

Maynard E. Walberg, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 9, 1979, Ser. No. 83,117
Int. Cl.³ B60P *1/40*
U.S. Cl. 414—523 **9 Claims**



1. A harvester having a bin for the harvested crop, an unloading conveyor swingable between a transport position and

a range of bin unloading positions including a driven material moving member, a drive mechanism for the material moving member including a clutch device shiftable between clutch engaged and clutch disengaged positions by a hydraulic actuator, and a control for operating the clutch device characterized by

electrically controlled valve means connected in controlling relation to said hydraulic actuator including a valve having clutch engaging and clutch disengaging positions,

a source of pressurized fluid connected to said valve,

an electric control system for said valve means including a safety switch shiftable between a first position in which said clutch device cannot be shifted from its clutch disengaged position to its clutch engaged position and a second position in which said clutch device may be shifted from its clutch disengaged position to its clutch engaged position, and

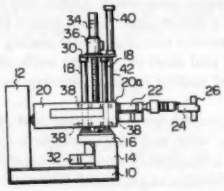
operating means for the safety switch responsive to the position of said unloading conveyor to automatically place said safety switch in said first position when said conveyor is moved out of its range of unloading positions and to automatically place said safety switch in said second position when said conveyor is in its unloading position.

4,289,441

INDUSTRIAL ROBOT

Hajimu Inaba, Hino, and Shigemi Inagaki, Musashino, both of Japan, assignors to Fijutsu Fanuc Limited, Tokyo, Japan

Filed Sep. 18, 1979, Ser. No. 76,616
Claims priority, application Japan, Sep. 29, 1978, 53-119155
Int. Cl.³ B25J *19/00*
U.S. Cl. 414—589 **4 Claims**



1. In an industrial robot having a robot hand, a vertically movable body on which the robot hand is mounted, a vertical drive means for causing a vertical movement of the vertically movable body guided by at least one vertical guide pillar, said vertical drive means including a feed motor, and a cylinder means for applying an upward force to said vertically movable body to thereby reduce the load applied by said vertically movable body and robot hand to said feed motor.

4,289,442

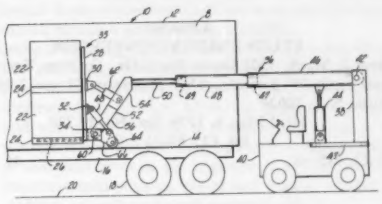
BOOM LIFT LOAD RELIEF

James L. Stevens, 14825 Arkansas St., Woodbridge, Va. 22191

Filed Oct. 26, 1979, Ser. No. 88,743
Int. Cl.³ B66F *9/10*
U.S. Cl. 414—629 **2 Claims**

1. In a cargo-transfer system comprising a storage space defined partly by a floor; a truck movable toward or away from the storage space; a boom mounted in cantilever fashion on the truck so that movement of the truck toward the storage space causes the boom to advance into the space; means for extending or retracting the boom in the direction of its length, whereby the free end of the boom can be moved back and forth within the storage space without relocating the truck; cargo-lifter mechanism carried by the free end of the boom; means supporting the boom on the truck for swinging movements in a vertical plane; and power means **(44)** trained between the truck and boom for swinging the boom vertically, whereby the lifter mechanism is enabled to deposit or remove cargo at various selected locations on the floor of the storage space; said cargo lifter mechanism comprising an upstanding rail structure **(28)** and a set of horizontally-extending forks **(26)** adapted to underlie a cargo pallet resting on the floor of the storage space:

the improvement comprising floor-engageable roller means carried by the cargo-lifter mechanism for substantially reducing gravitational loadings on the boom power means while cargo is being moved toward or away from its selected location on the floor of the storage space; support



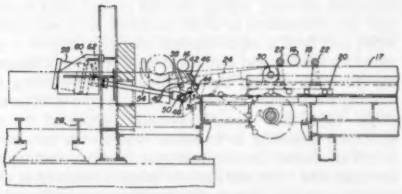
structure for the roller means comprising a downwardly-swingable arm means **(66)** pivotally connected to the aforementioned rail structure at a point near the rail structure lower end; the roller means being connected to the free end of the arm means for movement from an elevated position above the lower surfaces of the forks to a lowered position below the lower surfaces of the forks; and fluid power cylinder means **(68)** trained between the rail structure and the swingable arm means for moving the roller means between the elevated and lowered positions.

4,289,443

APPARATUS FOR SINGLY DISCHARGING CYLINDRICAL WORKPIECES FROM AN INCLINED ROLLWAY

Charles W. Jacob, Crafton Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1979, Ser. No. 12,407
Int. Cl.³ B66F *3/04*
U.S. Cl. 414—748 **3 Claims**



1. In an apparatus for singly discharging laterally aligned cylindrical workpieces from the lower end of an inclined rollway, said apparatus including a rocker having a pivot intermediate its ends disposed beneath said rollway, an elongated stop pin pivotally attached to said rocker on the end thereof adjacent the lower end of said rollway, an elongated index pin pivotally attached to said rocker on the end thereof adjacent the upper end of said rollway, said stop and index pins projecting upwardly toward the workpieces on the upper surface of the rollway, means for oscillating said rocker about its pivot to alternately advance and retract said pins, and first and second sleeve means receiving said stop and index pins respectively and for guiding the movements thereof,

the improvement in said apparatus which comprises:

said stop pin being aligned substantially normal to the plane of said rollway,

said index pin being spaced from the stop pin toward the

upper end of the rollway and inclined at an acute angle both with respect to the lower end of said rollway and the axial direction of said stop pin so as to contact the lower most workpiece held by said stop pin on a lower quadrant of the periphery thereof facing the upper end of said rollway,

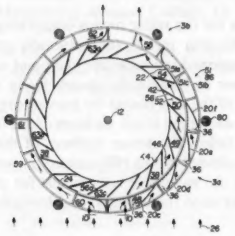
said index pin having a blunt end adjacent said workpieces, an upper surface of said blunt end being substantially parallel to the rollway surface, thus facilitating lifting of workpieces of a range of diameters over said stop pin without adjustment of the alignment of said index pin.

4,289,444

FLUID ENERGY CONVERTOR

Robert J. Monk, 1302 Green Brook Dr., De Soto, Tex. 75115, and Franz W. Loesche, 4761 Broadway, House 2-6E, New York, N.Y. 10034

Filed Mar. 1, 1979, Ser. No. 16,725
Int. Cl.³ F03D *7/06*
U.S. Cl. 415—3 **14 Claims**



1. A fluid energy convertor which produces from linear moving fluid a rotating torque used to perform useful work, comprising:

a support structure constructed to allow unrestricted entrance and exit of said fluid into and out of same;

a turbine rotatably supported by and positioned within said support structure whereupon being contacted by said moving fluid power is produced for performing useful work;

a structural assembly rigidly secured to said support structure and maintained at close clearance with said turbine when said fluid is unidirectional whereby support is provided for louvers and shrouds at fixed relative positions to the direction of said moving fluid for controlling said moving fluid which enters into said support structure;

multiple adjustable louvers pivotally supported by said structural assembly at locations where it is possible to divert maximum moving fluid quantities into said support structure and with said louvers being maintained at close clearance to said turbine and being automatically held at required open positions or required closed position by actuation means communicating with said louvers and said structural assembly whereby a controlled quantity of said fluid is diverted into said turbine;

a force induction shroud rigidly secured to said support structure at a location where maximum fluid velocity is available and where said moving fluid will travel a finite distance while in contact with said turbine and with said shroud being maintained at close clearance with said turbine whereby over said finite distance with said shroud and said turbine remained parallel and at close clearance said moving fluid will experience a velocity decrease as power from said moving fluid in the form of force and motion is imparted to said turbine;

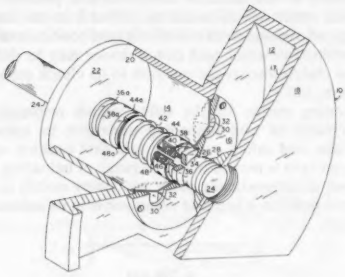
a protective shroud rigidly secured to said support structure at a location adjacent to outside turbine surfaces moving in a relative direction opposite from said moving fluid direction and maintained with clearance from said turbine whereby drag force is reduced on said turbine by diverting the moving fluid around the outside of said shroud.

4,289,445

ROTARY PUMP ASSEMBLY

James O. Sims, Rte. 2, Box 248, Hartselle, Ala. 35640

Filed Sep. 25, 1978, Ser. No. 945,558
Int. Cl.³ F04D *29/10*
U.S. Cl. 415—113 **4 Claims**



1. A rotary pump assembly comprising:

a generally circular pump enclosure;

a generally circular seal enclosure of reduced diameter to that of said pump enclosure and adapted to contain a lubricating fluid, said enclosures sharing a common wall, and said seal enclosure having a wall opposite to that of said common wall;

a rotary pump positioned within said pump enclosure and having a driven shaft which passes through said walls;

first and second stationary shaft sealing members positioned around said shaft in opposite walls of said seal enclosure, and said sealing members having facing planar seal surfaces;

first and second spaced rotating seal members around and rotating with said shaft, said first rotating seal member having a planar surface positioned adjacent to and adapted to frictionally engage said first stationary seal member, and said second rotating seal member having a planar surface adjacent to and adapted to frictionally engage with the planar surface of said second stationary seal member;

spring bias means for applying a bias to said rotating sealing members for biasing said rotating sealing members against said stationary sealing members; and

an opening in said common wall, and an annular diaphragm positioned within said seal enclosure adjacent said common wall and said opening, and being between said shaft opening and the circumference of said seal enclosure, whereby the fluid pressure in said pump enclosure adjacent said opening, being a pressure in a basically inner diameter region of said pump enclosure, is directly transmitted through said opening to said diaphragm and by said diaphragm to a fluid containable in said seal enclosure, and thereby a coordinate pressure applied as an additional bias to said rotating seal members.

4,289,446

CERAMIC FACED OUTER AIR SEAL FOR GAS TURBINE ENGINES

Matthew J. Wallace, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

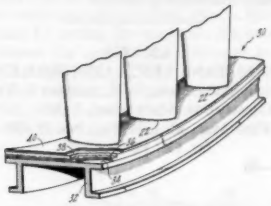
Filed Jun. 27, 1979, Ser. No. 52,634
Int. Cl.³ F28D *19/00*
U.S. Cl. 415—174 **9 Claims**

1. An outer air seal of the type circumscribing the tips of

rotor blades in the turbine section of a gas turbine engine, comprising:

a porous pad of flexible material having an arcuate contour; and

a ceramic facing material which is adhered to the low modulus pad to form a blade tip opposing surface wherein said ceramic facing material is characterized by



a modulus of elasticity at 1800° F. of approximately 1×10^6 lb/in^2;

mean tensile strength at 1800° F. of approximately 3450 lb/in^2;

coefficient of thermal expansion at 1800° F. of approximately 6.06×10^{-6} in/in-°F.; and

thermal conductivity at 1800° F. of approximately 5.55 Btu-in/hr-ft^2-°F.

4,289,447

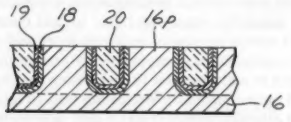
METAL-CERAMIC TURBINE SHROUD AND METHOD OF MAKING THE SAME

Albert P. Sterman, Cincinnati; Charles H. Gay, Jr., Loveland; Frederick W. Tegarden, Dean T. Lenahan and Martin C. Hemsworth, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 12, 1979, Ser. No. 84,244

Int. Cl.[3] **F01D** *25/24;* **B32B** *3/00*

U.S. Cl. 415—200 **14 Claims**



1. A turbine shroud structure of the type having a metal substrate and a ceramic sealing layer secured thereto, wherein the improvement comprises:

mechanical matrix bonding means disposed between said metal substrate and said ceramic sealing layer and bonding said ceramic sealing layer to said metal substrate with said ceramic sealing layer including an ordered pattern of very fine cracks which reduce the thermal stress in said ceramic sealing layer.

4,289,448

DEVICE FOR LIMITING THE FLAPPING MOVEMENTS OF A ROTARY-WING AIRCRAFT MAIN ROTOR

Marc A. Declerco, Pelissanne, and Gerard Margant, Aix en Provence, both of France, assignors to Societe Nationale Industrielle Aerospatiale, France

Filed Aug. 22, 1979, Ser. No. 68,797

Claims priority, application France, Aug. 23, 1978, 78 24480

Int. Cl.[3] **B64C** *27/40*

U.S. Cl. 416—140 **7 Claims**

1. In a rotary-wing aircraft main rotor assembly, including a rotor hub carried on a rotor shaft and rotatable about a fixed axis of rotation and at least two rotor blades having each its root connected to said hub via mechanical attachment means including connecting joints allowing flapping movements of said corresponding blade for rotation in opposite directions in a substantially vertical plane, about a flapping axis, substantially perpendicular to an axial plane of symmetry of said corresponding blade at rest,

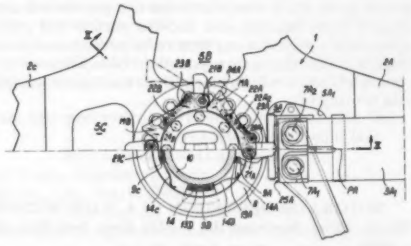
a device for limiting said flapping movements of said rotor blades comprising

for each blade, upper abutment means for limiting the upward rotary movement of said corresponding blade beyond a first predetermined position in said substantially vertical plane, said upper abutment means comprising:

a bent lever rotatably mounted on a pivot secured to a top part of said rotor hub and having a first arm the free end of which forms an abutment part and a second arm the end of which carries a predetermined weight,

a spring connecting said bent lever to said top part of said hub and being operable to normally rotate said bent lever in one direction and hold said bent lever in a predetermined position when the angular velocity of said rotor hub is below a predetermined value, said predetermined weight being operable to effect rotation of said bent lever in the opposite direct, beyond said predetermined position, when said angular velocity of said hub exceeds said predetermined value,

and bearing means carried by one of the two elements comprising said corresponding blade root and said corresponding attachment means and being engageable with said abutment part of said corresponding bent lever when said bent lever is held in said predetermined position to thereby prevent the upward rotary move-



ment of said blade beyond said first predetermined position in said substantially vertical plane wherein said corresponding pivot is parallel to said hub rotation axis near said blade axial plane of symmetry, and said first and second arms of said bent lever each rotates in a substantially horizontal plane, said first arm of said bent lever extending substantially parallel to said blade axial plane of symmetry when said bent lever is held in said predetermined position, and wherein said device also comprises lower abutment means for limiting the downward rotary movement of said corresponding blade beyond a second predetermined position in said substantially vertical plane, said upper abutment means comprising

a reciprocal ring, common for all said rotor blade and slidably mounted around said rotor shaft in a plane perpendicular to said hub rotation axis,

and for each rotor blade a bearing slide carried by one of said two elements, comprising said corresponding blade root and said corresponding attachment means, and being engageable with said reciprocal ring so that, when said corresponding blade is rotated downwards and said velocity is below said predetermined value, said corresponding blade tends to push inwards said reciprocal ring, which in turn tends to push upwards at least another of said rotor blades, at least one of said other blades being prevented from rotating upwards by its upper abutment means when said second predeter-

mined position in said substantially vertical plane is reached by said corresponding blade.

4,289,449

FAN WHEEL FOR ELECTRIC MACHINERY

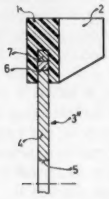
Manfred Frister, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,364

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804756

Int. Cl.³ B63H *1/16*

U.S. Cl. 416—185 **4 Claims**



1. A fan wheel for electrical machinery, especially generators used in motor vehicles, including an inner support assembly mounted on the shaft of the generator an outer fan ring supported by said support assembly, and wherein said support assembly is composed of a plurality of mutually adjacent component parts which comprise a disc-like portion and coplanar exterior rings adjacent said disc-like portion and positioned adjacent one another along their radial periphery, said exterior rings as well as the outer region of said disc-like portion being completely surrounded by molded plastic material constituting said fan ring (**1**)

and wherein said fan ring (**1**) is distinct from and joined to said support assembly.

4,289,450

ROTOR FOR OPERATION IN A FLOW MEDIUM

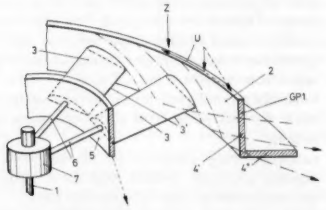
Alberto Kling, Seestrasse 38, D-8131 Berg, Fed. Rep. of Germany

Filed Oct. 23, 1979, Ser. No. 87,524

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852554

Int. Cl.³ F03D *1/06*

U.S. Cl. 416—192 **18 Claims**



1. A rotor for a wind power plant for operation without the influence of flow-guiding stationary housings or channels in a flow medium contained in a space of unlimited dimensions as compared to the rotor dimensions, comprising one set of rotor blades and a shroud arranged in the region of the periphery of the rotor having an axis and formed as an axially symmetrical outer annular shroud rotating in unison with the rotor, said outer annular shroud in a cross-section lying in an imaginary plane extending through the rotor axis having a profile the angle of attack of which is greater than its critical angle of attack with respect to a flow direction extending parallel to the rotor axis, said profile being adapted to generate a lift force under the effective flow conditions given at rotation of the rotor within the operational rotational speed range, and being oriented such that its suction side forms the inner side of the annular shroud, said profile having a downstream portion extending outwardly at a large angle away from the rotor axis and substantially transversely thereof.

4,289,451

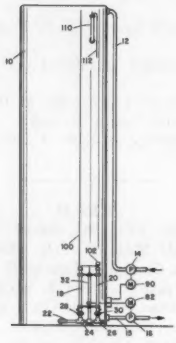
EXTERNAL TANK LEVEL CONTROL SYSTEM

Steven M. Lewis, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 30, 1979, Ser. No. 25,458

Int. Cl.³ F04B *49/04*

U.S. Cl. 417—40 **10 Claims**



1. A multi-level indicator and control system comprising in combination:

a liquid reservoir for holding liquid at selected levels;

input means for supplying liquid to said reservoir;

output means for removing liquid from said reservoir; and

level control means responsive to predetermined levels of liquid in said reservoir for activating said input means and said output means for regulating flow of liquid to and from said reservoir between said levels, said level control means comprising a first vertically oriented tubular member having a height less than the height of the reservoir disposed externally of and in open communication with the interior of said reservoir, a float and a switch responsive to the float disposed in said tubular member, said float responsive to a predetermined level of liquid in said tubular member for activating said switch, said tubular member having a closed upper end when liquid rises therein so that the liquid level is a function of the liquid level in said tank above the level in said tubular member, an electrical circuit including said switch for controlling one of said input means and said output means.

4,289,452

PRESSURE COMPENSATED PUMP

Charles A. Kubilos, Oxnard, Calif., assignor to Abex Corporation, New York, N.Y.

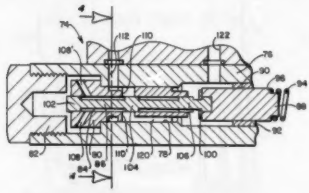
Filed Mar. 5, 1979, Ser. No. 16,739

Int. Cl.³ F04B *1/26*

U.S. Cl. 417—222 **4 Claims**

1. A pressure compensated piston pump comprising a casing, a barrel rotatably mounted in the casing, a plurality of bores in the barrel, a piston mounted for reciprocation in each bore, a shoe mounted on the end of each piston, a hanger pivotally mounted in the casing, a thrust plate attached to the hanger, means for connecting the pistons to the thrust plate wherein the shoes slide over the thrust plate when the barrel is rotated

and the pistons reciprocate in their bores when the hanger is on-stroke, the hanger is movable between an off-stroke position in which the pump displacement is a minimum and a full on-stroke position in which the pump displacement is a maximum, means for biasing the hanger to the full on-stroke position, a stroking piston which receives fluid and moves the hanger toward the off-stroke position when the pressure of the discharge fluid exceeds a predetermined maximum, a pressure compensator valve including a spool bore, a spool movable in the bore, means for setting the maximum discharge pressure of the pump, means for sensing the discharge pressure of the pump, a first control port, a first fluid passage connecting said first control port to the stroking piston, a second control port, a second fluid passage connecting said second control port to drain, a control land formed on said spool which cooperates



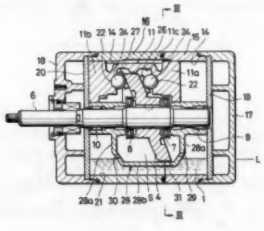
with said first and second control ports to form first and second variable orifices which control the flow of fluid to and from the first and second control ports, first means for connecting discharge pressure fluid to one side of the control land, a second means for connecting low pressure fluid to the other side of the control land, and the spool is movable alternatively between a first position in which said control land blocks said first and second control ports, a second position in which said first and second control ports are open to the second connecting means and drain, and a third position in which the first and second control ports are open to the first connecting means that discharge pressure is supplied to the first control port to move the stroking piston towards the off-stroke position and simultaneously discharge pressure fluid is supplied to drain through the second control port.

4,289,453

SWASH-PLATE TYPE COMPRESSOR

Tsunenori Shibuya, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1979, Ser. No. 24,679
Claims priority, application Japan, Apr. 8, 1978, 53/46292[U]
Int. Cl.³ F04B 1/16
U.S. Cl. 417—269 **3 Claims**



1. In a swash-plate type compressor having a pair of horizontal cylinder blocks, combined together in an axial alignment, a drive shaft penetrating said cylinder blocks along axes thereof for rotation relative to said cylinder blocks, and a swash plate secured to said drive shaft, said combined cylinder blocks including a plurality of cylinder bores extending through the cylinder blocks axially thereof, each receiving a piston for sliding therein, and a plurality of internal spaces axially defined between adjacent cylinder bores, wherein said swash plate has an outer fringe thereof disposed in engagement with the piston thereby to rotate in unison with the drive shaft being rotated, for causing reciprocal motion of the piston within the cylinder bore to carry out a pumping action,

the improvement wherein:

the lowermost of said internal spaces is provided with a partition wall having a generally concave configuration and dividing the space into an upper chamber for receiving at least an outer fringe portion of the swash plate, and a lower chamber for storing oil, said partition wall having at least a portion thereof positioned below an oil surface level in said lower chamber, wherein said partition wall has at least one first conduit formed therein and which is positioned at a level lower than the oil surface level in the upper chamber which is an elevated level obtained due to a to-and-fro movement of the swash plate after the compressor starts until the compressor reaches a predetermined rotational speed and also at a level higher than the oil surface level in the upper chamber which is obtained after the compressor reaches said predetermined rotational speed, said at least one first conduit providing communication between said lower chamber and said upper chamber, said partition wall also having at least one second conduit formed therin and positioned at a lower level than an oil surface level in said lower chamber to provide further communication between said upper and lower chambers, said at least one second conduit having such a diameter as to allow oil to flow through said second conduit at a minimum flow rate required, whereby the first conduit acts as an oil spill port and the second conduit as an oil feeding port; and comprising

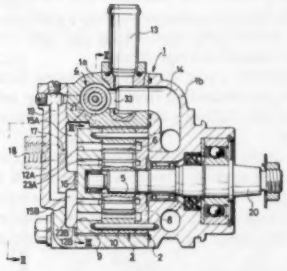
a filter material disposed on an inner wall of said upper chamber in a lower portion of said upper chamber so as to cover said second conduit, said filter material straining off metal powder and the like material.

4,289,454

ROTARY HYDRAULIC DEVICE

Hiroto Iwata, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1979, Ser. No. 79,770
Claims priority, application Japan, Oct. 3, 1978, 53-121689
Int. Cl.³ F04B 49/00
U.S. Cl. 417—300 **6 Claims**



1. A rotary hydraulic device comprising:

(a) a vane pump disposed in a casing and including a rotationally driven rotor having a plurality of radially disposed grooves,

(b) a plurality of vanes slidably fitted into said grooves,

(c) a cam ring in slidable contact with said grooves,

(d) a pair of delivery ports formed at symmetrical positions with respect to said rotor, said ports direct a fluid into a chamber which is formed by said rotor, vanes and cam ring and discharge said fluid therefrom,

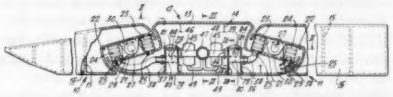
(e) a pair of independently separated delivery chambers communicate with said delivery ports, respectively,
(f) a control valve which shuts off the communication between one of said pair of delivery chambers and a hydraulic machine and returns the excess fluid from said delivery chamber to the tank side,
(g) a pressure plate including a pair of delivery ports, said pressure plate being in slidable contact with the end faces of said rotor and vanes, and
(h) a sealing member surrounds one delivery port and is interposed between said casing and said pressure plate.

4,289,455

DEVICES FOR EXTRACTING ENERGY FROM WAVES

Cecil A. Comyns-Carr, Bath, and Michael J. Platts, Willingham, both of England, assignors to The Secretary of State for Energy in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 7, 1979, Ser. No. 92,181
Claims priority, application United Kingdom, Nov. 17, 1978, 45113/78
Int. Cl.³ F03E *13/12*
U.S. Cl. 417—332 **3 Claims**



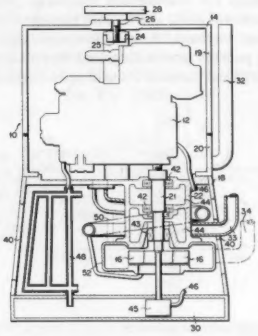
1. A device for extracting energy from sea waves and comprising:
(a) three pontoons aligned in series relationship;
(b) hinge means hingedly connecting adjacent pontoons in said series relationship;
(c) a platform provided by each pontoon at adjacent ends of the pontoons, adjacent said platforms being presented about the hinge axis of the respective hinge means and in opposing relationship to each other;
(d) a plurality of pump means distributed between adjacent pontoons, each pump means comprising a tubular bellows of rubber reinforced with fabric and having one end connected to one of the platforms and the other end thereof connected to the adjacent opposing platform, pairs of said pump means being disposed one each side of the hinge axis of the respective hinge means;
(e) a respective pump duct for each pump means, each said pump duct extending from a said pump means through one of the platforms to which said pump means is connected;
(f) a rectifying chamber for each pump means, each chamber having an inlet for the seawater in which the device is arranged to float, and a port for said seawater connected to said pump duct, and an outlet for seawater discharged from the pump means through the pump duct and the port;
(g) manifold means;
(h) branch duct means connecting each rectifying chamber to the manifold means;
(i) valve means disposed between the rectifying chambers of a said pair of pump means and connected to said rectifying chambers, said valve means being capable of connecting the said chambers so as to discharge one to another;
(j) turbine means to which the manifold means is connected; and
(k) electric generator means drivably connected to the turbine means.

4,289,456

UNDERWATER PUMP

Masamitsu Ishihara, 628 Hirai, Kannami-cho,, Tagata-gun, Shizuoka-ken,, Japan

Filed Oct. 26, 1978, Ser. No. 954,770
Claims priority, application Japan, May 24, 1978, 53/62098; May 24, 1978, 53/62099; May 24, 1978, 53/62100
Int. Cl.³ F04B *17/00*
U.S. Cl. 417—364 **6 Claims**



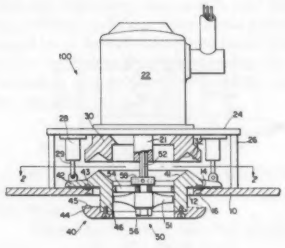
1. An underwater pump which comprises an engine received in a capsule in liquidtightness to drive impellers within an impeller casing when the pump body and engine capsule are immersed in water, said engine being connected to a suction pipe and exhaust pipe, each open at one end above the surface of the water, the exhaust pipe being cooled by the water and the lower end thereof being provided with a water-collecting section downwardly inclined from the horizontal direction to collect water deposited on the inner wall surface of the exhaust pipe and discharge same, water-collecting means disposed disposed between the lower end portion of the inclined water-collecting section and the impeller casing and designed forcefully to discharge water accumulated in the exhaust pipe by means of a negative pressure generated by water flowing into the impeller casing by the rotation of the impellers.

4,289,457

COMBINATION SEA VALVE AND DEBALLAST PUMP

Carl W. Porter, 315 N. Virginia Ave., Falls Church, Va. 22046

Filed Jul. 30, 1979, Ser. No. 62,093
Int. Cl.³ F04D *27/00*
U.S. Cl. 417—424 **6 Claims**



1. An apparatus for selectively controlling the flow of a fluid through a barrier, said barrier including an opening therethrough, said apparatus comprising:
means for blocking said opening;
means for selectively translating a movable portion of said blocking means to at least one operative unblocking position; and

means for impelling the fluid through said barrier, said impelling means being carried by said movable portion of said blocking means;

such that when said movable portion thereof is translated to an unblocking position, actuation of said impelling means causes control of the flow of the fluid in a preselected direction through said barrier.

4,289,458

FOOT PUMPS

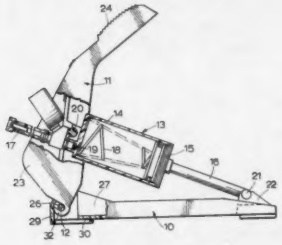
Ernest J. Price, Solihull, England, assignor to E. J. Price (Developments) Limited, Birmingham, England

Filed May 12, 1978, Ser. No. 905,560

Claims priority, application United Kingdom, May 13, 1977, 20095/77

Int. Cl.³ F04B *19/02, 29/00*

U.S. Cl. 417—464 **12 Claims**



1. A foot pump of the kind comprising a base member, an operating member, and a pivotal connection between said members, said operating member in use being depressed by the user's foot from a raised position, a piston-and-cylinder assembly connected between the operating member and the base member and operative to compress or expel air when the operating member is depressed from its raised position, and return spring means operative to urge the operating member towards its raised position, the invention wherein said pivotal connection comprises pivot pin means carried by one of said members and hook means carried by the other thereof; said pivot pin means and said hook means being constructed and arranged to be hooked together to form the pivotal connection between the members, said hook means being resiliently clipped onto the pivot pin means during assembly and opening in a direction that when the pump is in use the force exerted to depress the operating member and the force exerted by the spring means tends to retain the pivot pin means in the hook means rather than to urge the pivot pin means out of the hook means.

4,289,459

PROPORTIONING PUMP

William E. Neeley, 6152 Cardeno Dr., La Jolla, Calif. 92037, and Terrell F. Moose, 6119 Horton Dr., La Mesa, Calif. 92041

Filed Aug. 13, 1979, Ser. No. 65,921

Int. Cl.³ F04B *43/12, 45/08*

U.S. Cl. 417—475 **10 Claims**

1. A proportioning pump comprising:

a base;

a shaft having an x-axis and means for supporting it on said base;

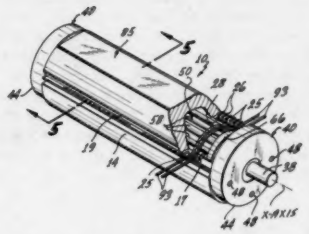
at least one roller cage assembly mounted on said shaft;

said roller cage assembly comprising a pair of laterally spaced and aligned plates each having a primary bore centered on said x-axis and through which passes said shaft, spaced a predetermined radius from the longitudinal axis of said primary bores are a plurality of secondary bores whose longitudinal axes describe circles in said laterally spaced plates, roller rods are journaled in said secondary bores;

elastic tubing adapted to be peristaltically compressed by said roller rods;

the outer perimeter of each of said roller rods describes an arc of a predetermined radius r_1 from the x-axis of said primary bore when said roller cage assembly is rotated about its longitudinal axis; and

a platen pressure surface having a concave transverse curvature of a predetermined radius r_2, said radius r_2 being greater than r_1 and having its center positioned below said



x-axis on a perpendicular line passing vertically through said x-axis whereby the spacing between the arc described by the outer surface of said roller rods and said pressure surface gradually decreases from a predetermined maximum to a predetermined minimum and then gradually increases back to a predetermined maximum.

10. A proportioning pump as recited in claim **1** wherein there are at least two roller cage assemblies on said shaft and there is an intermediate mounting plate on said shaft between said roller cage assemblies, said shaft being journaled in an axial bore of said intermediate mounting plate.

4,289,460

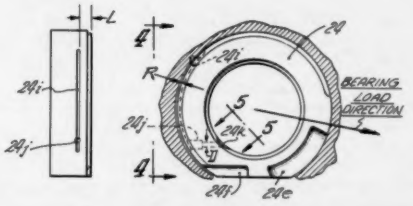
BEARING LUBRICATION SYSTEM FOR GEAR PUMP HAVING CLEARANCE BETWEEN BEARING AND HOUSING WALL FOR PREVENTING ENTRY OF CONTAMINANTS LARGER THAN LUBRICATION PASSAGE

Godwin L. Noell, Winsted, and Paul L. Haynes, Jr., Pleasant Valley, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Jun. 28, 1979, Ser. No. 52,789

Int. Cl.³ F04C *2/18, 15/00*

U.S. Cl. 418—78 **4 Claims**



1. In a gear pump of the type having a housing with a pumping cavity therein, an inlet in fluid connection with the cavity and an outlet in fluid connection with the cavity, at least two gears disposed in the cavity such that the teeth thereof are in meshing engagement, a shaft journal connected to one of the gears and a bearing in the cavity for mounting the shaft journal for rotation in an interior portion thereof, the bearing having an outer peripheral portion closely conforming to the adjacent cavity wall and the bearing having a face in confronting rela-

tionship to a side face of the said one of the gears, the resultant loading upon the bearing when substantial discharge pressure is developed being such as to urge the bearing into firm engagement with the inlet side of the pumping cavity wall whereby a clearance volume exposed to discharge pressure is defined between the discharge side of the pumping cavity wall and the outer periphery of the bearing, the improvement comprising:

a lubrication passage in the bearing fluidly interconnecting the clearance volume with the interior portion of the bearing for directing lubricating fluid to the shaft journal;

a groove on the outer periphery of the bearing in communication with the clearance volume and the lubrication passage for supplying fluid thereto;

the entrance to the clearance volume adjacent the said one of the gears being of a predetermined radial dimension adequate to provide satisfactory lubrication but sufficiently small to prevent entry of certain contaminants and the lubrication passage being sized larger than the clearance entrance radial dimension so as not to be obstructed by contaminants traversing the entrance and entering the clearance volume.

4,289,461

LIQUID INJECTED COMPRESSOR WITH TEMPERATURE CONTROL OF LIQUID

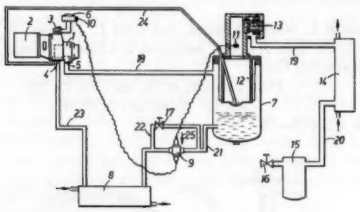
Gosewinus F. van Oorschot, Breda, Netherlands, and Kaj B. I. Emanuelsson, Edegem, Belgium, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Jul. 9, 1979, Ser. No. 55,952

Claims priority, application Sweden, Jul. 11, 1978, 7807707

Int. Cl.³ F04C *29/04*

U.S. Cl. 418—84 **8 Claims**



1. A liquid-injected compressor device for avoiding condensation in the outlet of the compressor, comprising a compressor **(1)** provided with a first inlet **(3)** for working medium, a second inlet **(4)** for injection of liquid for cooling the working medium and an outlet **(5)** for compressed working medium, a liquid separator **(7)** connected to said outlet **(5)** and a liquid cooler **(8)** connected to said liquid separator **(7)** and to said second inlet **(4)** characterized by a control valve unit **(9** or **71,72,73)** provided with two sensors **(10,11)** for regulation of said cooling, whereby one of the sensors **(10)** is arranged for sensing the condition of the working medium at said first inlet **(3)** and the other sensor **(11)** is arranged for sensing a condition which stands in a predetermined relation to the condition of the compressed working medium at said outlet **(5)** and that said sensors **(10,11)** are arranged to actuate the control valve unit **(9** or **71,72,73)** in opposite directions.

4,289,462

APPARATUS FOR MANUFACTURING VITREOUS BLAST FURNACE SLAG

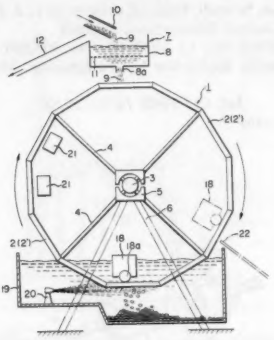
Ryo Ando; Kazuyoshi Sato, both of Yokohama, and Akira Honda, Kamakura, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1979, Ser. No. 77,044

Claims priority, application Japan, Oct. 16, 1978, 53-126098

Int. Cl.³ B22C *5/08*

U.S. Cl. 425—8 **7 Claims**



1. An apparatus for manufacturing a vitreous blast furnace slag, which comprises:

a rotary drum having a center axle, and a substantially circular barrel which comprises a plurality of rectangular cooling metal members endlessly connected together, each of said plurality of cooling metal members having a plurality of narrow and deep cooling grooves on the outer surface thereof with the longitudinal direction of said cooling grooves being substantially in parallel with the rotating direction of said rotary drum, and each of said plurality of cooling grooves comprising an outwardly flaring inlet section for receiving a molten blast furnace slag and an inwardly narrowing cooling section following said inlet section, for rapidly cooling and solidifying the molten blast furnace slag into a vitreous blast furnace slag;

a driving mechanism connected to the center axle of said rotary drum for rotating said rotary drum;

a molten blast furnace slag feeder including a slag container, arranged above said rotary drum, said molten blast furnace slag feeder being adapted to receive a molten blast furnace slag discharged from a blast furnace into said slag container to to pour said molten blast furnace slag thus received into said plurality of cooling grooves of said cooling metal members at about the highest position of the barrel of said rotary drum during rotation of said rotary drum;

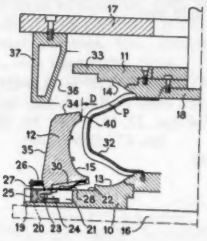
a stripper stationarily arranged at a prescribed position in said rotary drum adjacent to the inner surface of the barrel of said rotary drum, said stripper being adapted to take out a cooled and solidified vitreous blast furnace slag in said plurality of cooling grooves of said cooling metal member; and

a cooling tank containing cooling water, arranged below said rotary drum so that the lower portion of the barrel of said rotary drum is immersed in the cooling water, said cooling tank being arranged and adapted to cause said plurality of cooling metal members forming the barrel of said rotary drum to successively pass through the cooling water in said cooling tank during rotation of said rotary drum, thereby cooling said cooling metal members heated by the high-temperature molten blast furnace slag poured into said cooling grooves.

4,289,463
SEGMENTED MOLD FOR TIRE CASING

Roger Le Moullac, Le Plessis Bouchard, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France

Continuation of Ser. No. 771,575, Feb. 24, 1977, abandoned.
This application Jul. 8, 1980, Ser. No. 166,823
Claims priority, application France, Feb. 24, 1976, 76 05184
Int. Cl.³ B29H *5/02*
U.S. Cl. 425—47 **6 Claims**



1. A segmented mold for molding tire casings which comprises a fixed lower mold part for molding one side wall of the tire, a series of molding segments for molding the tread movably mounted on said lower mold part to be slidable and swingable along radial planes, an axially movable upper mold part for molding the other side wall of the tire, and means cooperating with the segments to engage and move said segments toward each other along said radial planes, said mold further comprising in combination:

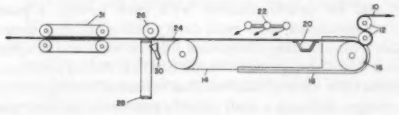
(a) elastic means interposed between the fixed lower mold part and the segments for continuously urging each of said segments toward an open position in which the segments are radially retracted and swung upward and to the outside of the mold to free a passage for the tire when the upper mold part is lifted off, said elastic means including first spring means for pulling each segment radially outward and second spring means for tilting each segment vertically upward toward an open position, and

(b) means for axially moving the upper mold part operating independently of the means for moving the segments toward each other along said radial planes, thereby allowing the upper mold part to be lowered into a molding position before the operation of said means for radially moving the segments toward each other, and being removed after disengagement of said means for effecting movement of said segments toward each other.

4,289,464
RETICULATED WEB MAKING APPARATUS

John N. Hall, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 971,594, Dec. 20, 1978, Pat. No. 4,226,828.
This application Mar. 6, 1980, Ser. No. 129,548
Int. Cl.³ B29C *17/10*; B29D *7/02*; B29C *17/04*
U.S. Cl. 425—66 **4 Claims**



1. Apparatus for forming a reticulated web net comprising:

film supply means providing a thermoplastic polymeric film in a thermoformable condition;

perforated continuous surface means adjacent said film supply means, said film contacting the surface of said perforated continuous surface means;

pressure differential means adjacent said perforated continuous surface means to force portions of said film into the perforations of said surface thus forming pips, wherein the thickness of said continuous surface means is greater than the length of said pips;

cooling means positioned adjacent said pressure differential means and said perforated continuous surface means to harden said film;

stripping means adjacent said cooling means to strip the film from said perforated continuous surface means;

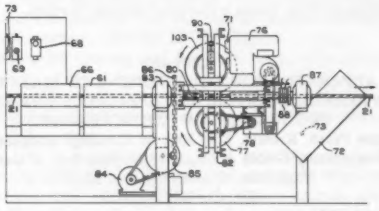
skiving means adjacent said stripping means to cut off said pips at the surface of the film thereby creating the perforated film; and

orienting means adjacent said skiving means to biaxially orient the film into a reticulated web net.

4,289,465
APPARATUS FOR FORMATION OF PULTRUDED FIBER GLASS REINFORCED TWISTED ARTICLE

Charles W. Killmeyer, deceased, late of Pittsburgh, Pa. (by Elizabeth A. Killmeyer, executrix); James E. Lane, Henrietta; Leslie L. Taylor, Jr., Forest City, and Joe T. Pearson, Lawndale, all of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 7, 1979, Ser. No. 101,990
Int. Cl.³ B29D *3/02*
U.S. Cl. 425—111 **8 Claims**



1. Apparatus for producing a fiber reinforced pultruded rod having a plurality of twisted protrusions and grooves on its surface, comprising means to coat fibers with a resin shaping means to form the coated fibers into a rod having protrusions and grooves thereon, heating means to partially cure said rod to form a solid rod, rotatable opposed surfaces engaging said rod to pull the rod through said heating means and means to rotate said opposed rotating surface around the axis of the rod continuously to impart a twist to the rod between the shaping means and the opposed surfaces as the rod is being pulled.

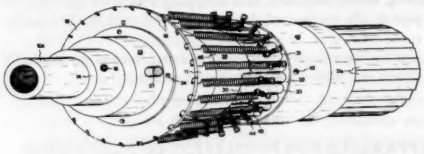
4,289,466
APPARATUS FOR THE CONTINUOUS MANUFACTURE OF HOLLOW TUBULAR ELEMENTS

Otto W. Weeper, Calle Bolivar No. 30, Turmero, Edo, Aragua, Venezuela

Filed May 2, 1980, Ser. No. 146,180
Int. Cl.³ B29C *3/02*
U.S. Cl. 425—112 **17 Claims**

1. An apparatus for continuously manufacturing hollow tubular elements, comprising an elongated central core having a longitudinal axis and one end portion connectable with drive means to be rotated about said longitudinal axis; a plurality of supporting elements projecting circumferentially outwardly from said central core and longitudinally spaced along the same, each supporting element being provided with a plurality of guiding means circumferentially distributed around the same and axially aligned with one another; a cam element forming a cam surface arranged circumferentially about said

longitudinal axis of said core and extending in a plane which is helical with respect to a plane transverse to said axis; a plurality of rod elements forming a substantially cylindrical molding surface, said rod elements being arranged in side-by-side relationship and extending longitudinally over the entire length of said central core in a circumferentially spaced relationship with the latter, said rod elements being aligned on said supporting elements and guided in an individual cyclic displacement by said guiding means, each of said rod elements being arranged immediately following said cam element and urged against said cam surface of the latter, said cam element with



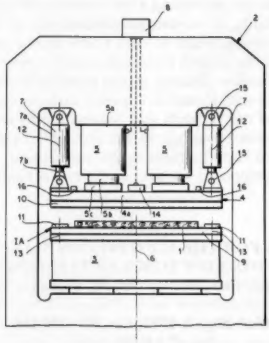
said surface being supported in a non-revolving manner on said central core so that during the rotation of said central core said cam surface remains immovable, whereby when each rod element is being displaced cyclically and biased against said immovable cam surface, it will perform a movement of extension and retraction in the direction of said longitudinal axis of said core, so that a continuous strip of a tubular body forming element can be wound helically about said molding surface with constant advance of one spiral with respect to the other and with a pitch between spirals equal to the width of the continuous strip, minus a marginal overlap portion.

4,289,467

APPARATUS FOR THE PRESSING OF MATS OF PRESSABLE MATERIAL, ESPECIALLY FOR THE PRODUCTION OF PARTICLEBOARD

Jürgen Pesch, Krefeld, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Mar. 6, 1980, Ser. No. 127,572
Int. Cl.³ B28B *17/00*
U.S. Cl. 425—141 **5 Claims**



1. A platen press for the compression of a mat to produce a board, comprising:

a support;

a rigid fixed bed mounted on said support and adapted to receive said mat;

at least two spacer bars disposed on said fixed bed and flanking said mat;

a deformable movable bed juxtaposed with said fixed bed;

main cylinder means including a plurality of main piston-and-cylinder arrangements disposed between said support and said movable bed for displacing said movable bed to compress said mat against said fixed bed;

auxiliary cylinder means including at least two bearing cylinders aligned with said spacer bars and disposed between said movable bed and said support for clamping said movable bed against said spacer bars to effect compressive deformation of said movable bed; and

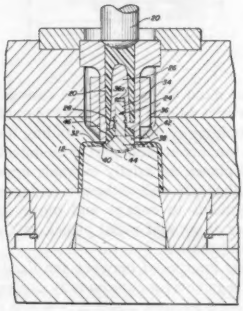
control means including a deformation-measuring device responsive to the deformation of said movable bed for operating said main piston-and-cylinder arrangements to level deformation of said bed and thereby parallel compression of said mat.

4,289,468

HYDROSTATIC MOLD GATE

John W. von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Apr. 27, 1979, Ser. No. 33,905
Int. Cl.³ B29F *1/05*
U.S. Cl. 425—146 **16 Claims**



1. A gate for a mold which comprises, a molding compound inlet conduit defining an outer end for communication with a source of molding compound, and an inner end for communication with a mold cavity, and a plunger member slidably mounted adjacent said molding compound inlet conduit and adapted to prevent flow through said conduit in a first sliding position, and to permit flow through said conduit in second sliding positions, said plunger defining a shaft slidably positioned in a receptacle and an enlarged end proportioned to prevent said flow through the conduit in the first position, said plunger defining a mold cavity-facing surface which is of larger cross-sectional area than the surface of the plunger opposed to said mold chamber and subject to contact with pressurized molding compound in said conduit, whereby relatively pressurized molding compound in the conduit causes said plunger to spontaneously advance to open into a second sliding position by the action of pressure on said opposed surface, and essential equalization of the pressures in the mold cavity and the conduit causes said plunger to spontaneously retract to close to its first sliding position.

13. In a multiple cavity mold system, a plurality of gates, one for each mold cavity, and a molding compound inlet conduit communicating with each cavity defining an outer end for communication with a source of molding compound and an inner end for communication with each cavity, a plunger member associated with each cavity being slidably mounted adjacent said molding compound inlet conduit and adapted to prevent flow through said conduit in a first sliding position and to permit flow through said conduit in second sliding positions, said plunger defining a shaft slidably positioned in a receptacle and an enlarged end proportioned to prevent said flow through the conduit in first position, said enlarged end defining a mold cavity-facing surface which is of larger cross-sectional area than the surface of the plunger opposed to said mold cavity and subject to contact with pressurized molding compound in

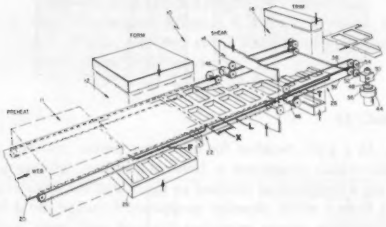
said conduit, whereby relatively pressurized molding compound in the conduit causes said plunger to spontaneously advance to open into a second sliding position by the action of pressure on said opposed surface, and essential equalization of the pressures in the mold cavity and the conduit causes said plunger to spontaneously retract to close to its first sliding position.

4,289,469

APPARATUS FOR FORMING AND TRIMMING ARTICLES FROM A WEB

Karl H. Keim, South Portland, Me., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed May 16, 1980, Ser. No. 150,310
Int. Cl.³ B29C *17/04*
U.S. Cl. 425—302.1 **13 Claims**



1. In an article forming machine adapted to produce discrete articles from a continuous web of material, the machine comprising

a forming press for forming the articles in the web,

a trimming station including a press for trimming the articles from the web, and

a web transport means for advancing the web past the forming and trimming presses,

said forming press being constructed to form on each press cycle a plurality of articles arranged over a plurality of unit lengths in the direction of advance of the web, the improvement wherein,

said web transport means comprises

first conveyor means for advancing the web to said forming press and thence to said trimming station,

second conveyor means for advancing the formed web through said trimming station,

said first and second conveyor means including means for positively engaging the web so as to prevent longitudinal slippage of the web relative to said conveyor means,

first drive means for driving said first and second conveyor means in unison to advance a section of formed web into said trimming station in such a manner that registry is maintained between said first and second conveyor means,

severing means operable after said unison movement for severing the web at a location between said conveyor means to provide at said trimming station a severed section of said formed web made up of a plurality of said unit lengths, and

second drive means for repetitively moving said severed section of web forward a single said unit length at a time within said trimming station while said first conveyor means is stationary,

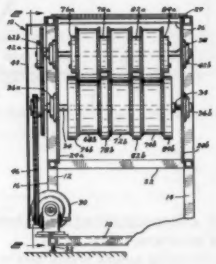
said trimming press includes die means extending over only one said unit length, said die means being operable, following each said unit-length movement of said second conveyor, to trim from said web those articles extending along said one unit length of said web.

4,289,470

LASAGNA NOODLE RIPPLER

Michael L. Johnston, Champlin; Loren J. Gordon, Osseo, and Dietrich E. Weinauer, Minnetonka, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Apr. 30, 1980, Ser. No. 145,275
Int. Cl.³ A21C *11/24*
U.S. Cl. 425—336 **18 Claims**



1. An apparatus for shaping dough ribbons into lasagna strands having opposite marginal edges undulated to provide ruffles, comprising:

A. a support structure;

B. a first horizontally aligned shaft rotatably mounted on said support structure;

C. a second horizontally aligned shaft vertically oriented relative to said first shaft and parallel thereto, said second shaft rotatably mounted on said support structure;

D. means for rotating said first shaft about its longitudinal axis;

E. means for counter rotating said second shaft about its longitudinal axis in response to rotational movement of said first shaft;

F. a pair of matching crimp rolls, said crimp rolls each having a pair of opposite marginal peripheral edges undulated to form fluting wherein the fluting extends equidistantly within and beyond the roll radius and wherein the crimp rolls are mounted on each shaft such that the fluting of one of the rolls is both in rotational and in lateral alignment with the fluting of the other roll;

G. means for fixedly connecting a first crimp roll to the first shaft so that it is caused to rotate about the shaft axis as the shaft rotates;

H. means for operatively connecting a second crimp roll to the second shaft so that said second crimp roll is caused to rotate about the shaft axis as the shaft rotates.

4,289,471

APPARATUS FOR FORMING A SHEET OF DRY WOOD PULP

John H. Dunbar, Marlborough, and Kenneth L. Gray, Kenilworth, both of England, assignors to Courtaulds Limited, London, England

Filed Dec. 14, 1978, Ser. No. 969,580
Claims priority, application United Kingdom, Dec. 19, 1977, 52692/77
Int. Cl.³ B29C *17/10*
U.S. Cl. 425—373 **12 Claims**

1. An apparatus for forming a coherent and substantially uniform sheet of dry wood pulp comprising:

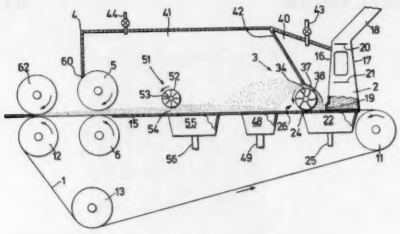
(a) feed conveying means arranged to receive and convey the wood pulp as a layer,

(b) a spreader having

(i) a first member which comprises an assembly of blades extending across the feed conveying means and rotatable so that the blades at their lowest position are closely adjacent to the feed conveying means and rotate towards

the wood pulp on the feed conveying means at a speed sufficient to blow the wood pulp off the feed conveying means and to suspend the wood pulp in air and

(ii) a second member positioned so that the wood pulp thus suspended in air has to pass between the first and second members before being discharged from the spreader and is



subjected to a fiber-separating action between the said first and second members,

(c) collection conveying means positioned to receive and convey the wood pulp discharged from the spreader, and

(d) means for consolidating the wood pulp received by the collection conveying means to form a coherent and uniform sheet.

4,289,472

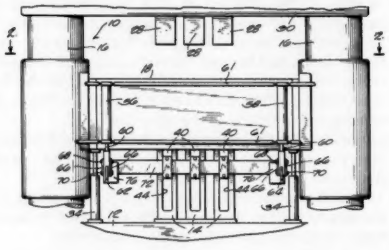
PRESS FOR REFRACTORY MATERIAL AND HAVING REMOVABLE CORE MOVING APPARATUS

Robert J. Dorsey, Chicago, Ill., assignor to Wehr Corporation, Milwaukee, Wis.

Continuation of Ser. No. 85,481, Oct. 17, 1979, abandoned. This application Sep. 23, 1980, Ser. No. 190,169

Int. Cl.³ B30B *11/02*

U.S. Cl. 425—415 **30 Claims**



1. A press for use in compressing refractory material and comprising a press bed, a mold table, means for supporting the mold table for movement toward and away from the press bed, a mold box supported by the mold table, the mold box including at least one vertically extending mold cavity, means for compressing material placed in the mold cavity, the compressing means including a plunger assembly having at least one plunger supported by the press bed and adapted to be inserted into a portion of the mold cavity, the plunger including a core therein, the core being reciprocally movable with respect to the plunger and into and out of a second portion of the mold cavity when the plunger is received in the mold cavity, and means for causing reciprocal movement of the movable core, said means for causing reciprocal movement of the movable core including a first pair of generally parallel lift bars, means for supporting the lift bars beneath the mold table and for causing vertical reciprocal movement of the lift bars, a pair of generally parallel cross bars positioned transversely to the lift bars, extending therebetween and connected thereto for movement with the pair of lift bars, and means for connecting the core to the cross bars for vertical movement with the cross bars.

4,289,473

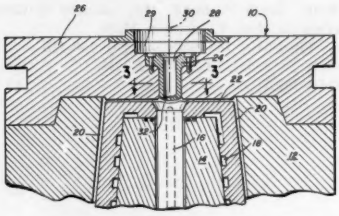
MOLD GATE PERMITTING THE INTRODUCTION OF STIFF MOLDING COMPOUND INTO A MOLD CHAMBER

John W. Von Holdt, 7430 N. Croname Rd., Niles, Ill. 60648

Filed Jan. 4, 1980, Ser. No. 109,478

Int. Cl.³ B29C *1/00*

U.S. Cl. 425—567 **11 Claims**



1. In a gate member for admitting plastic material into a mold, which comprises a hollow member defining a bore having a longitudinal axis and an inner wall for separating said bore from a mold chamber positioned between mold halves, and aperture means extending through said inner wall, the improvement comprising:

said aperture means being peripherally spaced from the longitudinal axis, and defining an angle of essentially 30° to 90° to the longitudinal axis, diverging outwardly in the direction of said mold chamber, said inner wall defining a centrally positioned peak upstream of said peripherally-spaced aperture means, pointing toward said bore, and having sloping sides, to assist in directing molten plastic toward said peripherally-spaced aperture means.

7. In a gate member for admitting plastic material into a mold, which comprises a hollow member defining a bore having a longitudinal axis, and an inner wall for separating said bore from a mold chamber positioned between said mold halves, and aperture means extending through said inner wall, the improvement comprising,

said aperture means being peripherally spaced from the longitudinal axis and defining an angle to the longitudinal axis, diverging outwardly in the direction of said mold chamber, said inner wall defining rib means extending radially from a central portion of the inner wall toward the periphery thereof, to reinforce said inner wall against the pressure imparted by the injection of molding compound through said gate.

4,289,474

PROCESS OF COMBUSTING A PREMIXED COMBUSTION FUEL

Juichi Honda, Fujisawa; Michiaki Matumoto, Tokyo, and Sadao Mimori, Saitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 771,912, Feb. 25, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 44,994

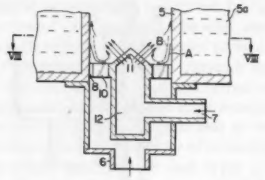
Claims priority, application Japan, Mar. 1, 1976, 51-21115

Int. Cl.³ F23M *3/04*

U.S. Cl. 431—10 **12 Claims**

1. A process of combustion having a lower NO_x generation rate, comprising the steps of premixing gaseous fuel and a primary air to create a mixture within a combustibility limit with respect to the fuel, generating a flame extending in a parallelly disposed, contacting relationship with respect to a cooling wall by combustion of the mixture so as to form a

maximum temperature region slightly downstream of a first reaction region in the flame, and feeding secondary air to the



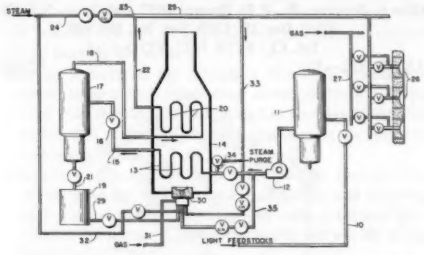
maximum temperature region from a side of the flame opposite to the cooling wall toward the cooling wall.

4,289,475

STEAM VAPORIZATION OF OIL

Fraser M. Wall, Warrington; Maurice R. Kitzen, Wyncote, and T. Frederick Kreipe, Oreland, all of Pa., assignors to Selas Corporation of America, Dresher, Pa.

Filed Jan. 5, 1977, Ser. No. 756,848
Int. Cl.³ F23D *11/44*; F27B *5/14*
U.S. Cl. 431—11 **41 Claims**



1. In a process for steam vaporization of a liquid hydrocarbon consisting essentially of oil or naptha having an API gravity of about 10–80 for introduction at a predetermined steam-hydrocarbon nozzle temperature into the nozzle of a burner, said burner being constructed for burning a gas of a predetermined Wobbe number, at a predetermined nozzle gas temperature, the steps which comprise:

preheating said liquid hydrocarbon to a preselected temperature so that it is at least partially in the vapor phase,

supplying steam in the quantity of about 0.1 to 1 pound of steam per pound of said hydrocarbon,

mixing said preheated hydrocarbon with said steam at a pressure of about 30–150 pounds per square inch gauge,

heating the resulting mixture to a mixture temperature in the range of 450° to 800° F., said mixture temperature being above the condensation temperature of the mixture at the nozzle, and said mixture temperature being such as to impart to said resulting mixture a Wobbe number essentially equivalent to the predetermined Wobbe number of said gas at said predetermined nozzle gas temperature,

delivering said hydrocarbon and steam as a vaporized mixture to the nozzle of said gas burner, and

burning said vaporized mixture in said gas burner.

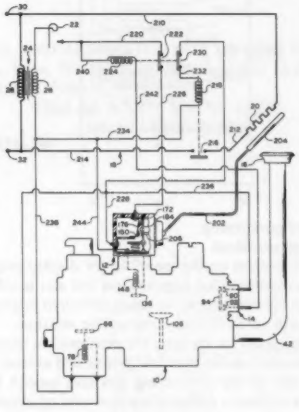
27. Apparatus for burning either liquid hydrocarbon or gas comprising a gas burner having nozzle means for burning air and gas, said gas having a predetermined Wobbe number at a predetermined nozzle gas temperature, a gas conduit connected thereto, means for supplying liquid hydrocarbon to a vaporizing apparatus, means for supplying steam to said vaporizing apparatus, said vaporizing apparatus comprising means for preheating said liquid hydrocarbon to a predetermined temperature to at least partially vaporize said hydrocarbon, means for mixing said preheated hydrocarbon with steam at a ratio of about 0.1 to 1.0 pound of steam per pound of hydrocarbon under pressure in the range of about 30 to 150 pounds per square inch gauge, means for heating said mixture to a temperature in the range of about 450° to 800° F. whereby said mixture has essentially the equivalent Wobbe number as said gas at said burner nozzle, and means for feeding said heated mixture to said gas burner nozzle.

4,289,476

DIRECT IGNITION GAS BURNER CONTROL SYSTEM

Charles D. Visos, and Carl F. Fernstrom, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 11, 1979, Ser. No. 56,502
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—66 **4 Claims**



1. In a gas burner control system,

a burner;

an electrical resistance igniter for igniting said burner;

two valves connected fluidically in series with said burner;

a thermostatically actuated switch responsive to igniter temperature and burner flame having a "cold" contact position, a "hot" contact position, and an intermediate contact position;

circuit means for effecting opening of a first of said two valves including said thermostatically actuated switch in said "cold" contact position;

circuit means for effecting energizing of said igniter including said thermostatically actuated switch in said "cold" contact position;

a pressure actuated switch actuated to a closed contact position when said first valve is open;

circuit means including said thermostatically actuated switch in said intermediate contact position for effecting opening of a second of said two valves so that gas flows to said burner in the event that said pressure actuated switch is actuated to an open contact position due to a momentary drop in gas pressure when said second valves opens; and

circuit means energized through said pressure actuated switch in said closed contact position when said thermostatically actuated switch is moved into said "hot" contact position for maintaining said valves open and for effecting de-energizing of said igniter under normal burner operation, for automatically initiating a new burner cycle in the event of a power or gas failure, and for providing a lock-out condition, wherein gas flow to said burner and energizing of said igniter is prevented, in the event ignition

should not initially occur or is not responded to by said thermostatically actuated switch.

4,289,477

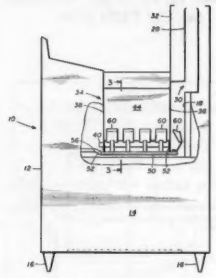
COOKING SYSTEM

Lewis F. Moore, and George M. Price, both of Shreveport, La., assignors to The Frymaster Corporation, Shreveport, La.

Division of Ser. No. 447,091, Mar. 1, 1974, Pat. No. 3,938,948, which is a division of Ser. No. 223,443, Feb. 4, 1972, Pat. No. 3,809,062. This application Dec. 15, 1975, Ser. No. 640,740

Int. Cl.³ F23M *9/06*

U.S. Cl. 431—171 **4 Claims**



1. A burner comprising:

a gas supply manifold;

at least two orifices on the manifold for discharging gas jets in such directions that adjacent gas jets and secondary air entrained therein interact to cause turbulent intermixing of the gas and air to form a combustible mixture;

combustion means for burning the combustible mixture; and

a target mounted on the manifold positioned at least partially in the path of the interacting jets and spaced from the orifices a sufficient distance to allow said adjacent gas jets to substantially converge to form the combustible mixture before reaching the target, said target having a planar face facing generally toward said interacting jets and angled to intercept the path of the interacting jets to deflect the combustible mixture into a combustion zone and to reflect and radiate heat toward the combustion zone, said target further comprising a plurality of independent projections extending substantially normal from the planar face to enhance the turbulent mixing, and side walls on opposite sides of the planar face to enhance the deflection of the combustible mixture toward the combustion zone.

4,289,478

CIGARET GAS LIGHTER

Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Japan

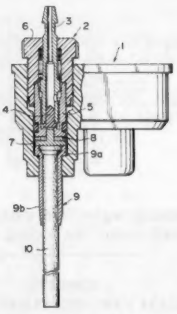
Filed Sep. 20, 1979, Ser. No. 77,379

Claims priority, application Japan, Sep. 21, 1978, 53/116190

Int. Cl.³ F23D *13/04;* **F23Q** *2/08*

U.S. Cl. 431—344 **3 Claims**

1. A cigarette gas lighter comprising a plastic fuel gas tank, a burner mounted on the plastic fuel gas tank, a nozzle bottom in said burner, a pin disk in said burner having a pin inserted into the nozzle bottom and a flat surface facing downwardly to the tank, a fuel take-up wick hung from the burner, said wick extending from said flat surface of the pin disk downwardly into a liquified fuel gas in the gas tank with an upper end of said wick held in direct contact with the flat surface of the pin disk, and a metal heat collecting member provided along the upper part of the wick with an upper end thereof held in direct contact with the flat surface of the pin disk and with the major portion thereof held in contact with the wick, whereby the heat of vaporization for vaporizing the liquified fuel gas is supplied to the burner by way of said metal member, and the upper ends of said wick and heat collecting member having



downwardly extending tapered portions in engagement with each other to prevent relative movement therebetween.

4,289,479

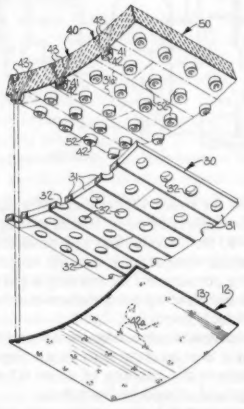
THERMALLY INSULATED ROTARY KILN AND METHOD OF MAKING SAME

Allen S. Johnson, Jr., P.O. Drawer 1037, Salisbury, N.C. 28144

Filed Jun. 19, 1980, Ser. No. 160,989

Int. Cl.³ F27B *7/28;* **F27D** *1/16*

U.S. Cl. 432—3 **22 Claims**



1. In a rotary kiln for heat treating aggregate and having an elongate cylindrical metal kiln wall; the combination therewith of

a wear-resistant thermal protective, annular liner extending around the interior surface of at least a substantial length-wise portion of the kiln wall and comprising a plurality of elongate, annular liner sections,

each liner section including

a layer of thermal insulation material positioned against the interior surface of the kiln wall and including a plurality of contiguous lightweight thermal insulating blocks having openings through medial portions thereof extending generally perpendicular to the kiln wall so as to provide openings throughout said layer of insulation material,

a layer of relatively hard cast refractory material overlying said layer of insulation material and having a plurality of spaced-apart column portions of the refractory material projecting inwardly from the refractory mate-

rial layer and through the openings in said layer of thermal insulation material and positioned against the interior surface of said kiln wall so that the cast refractory material is essentially supported by said column portions thereof engaging said kiln wall, and

anchor brackets secured to the interior surface of the kiln wall and projecting outwardly through said column portions and into said layer of cast refractory material so that said column portions are in surrounding relation to the respective anchor brackets and so that said anchor brackets reinforce said layer of refractory material and also firmly anchor both said layer of insulation material and said layer of refractory material to said kiln wall, and

an annular fire barrier wall of refractory material disposed between and connecting adjacent iner sections and also being positioned against and extending around the interior surface of the kiln wall and projecting therefrom a distance about equal to the combined thickness of said layers of said insulation material and refractory material of each of said liner sections.

21. A method of constructing a wear-resistant, thermal protective, annular liner on the interior surface of an elongate cylindrical metal wall of a rotary kiln of the type used for heat treating aggregate, said method comprising

providing a plurality of lightweight, substantially rectangular thermal insulating blocks with openings through medial portions thereof, building at least one annular section of the liner by the steps of

forming a layer of the insulating blocks in contiguous relationship against the interior surface of the kiln metal wall with the blocks oriented so that portions of the kiln metal wall are visible through openings in the layer of insulating blocks,

inserting end portions of anchor brackets through the openings in the layer of insulating blocks and securing such end portions to the kiln wall with outer arm portions of the anchor brackets projecting outwardly of the blocks, and

forming a layer of refractory material against the thus formed layer of insulating blocks by casting a slurry of the refractory material against the layer of insulating blocks while forming supporting columns projecting inwardly from the layer of refractory material by casting the same into and through the openings in the layer of insulating blocks, and while forming the layer of refractory material to a thickness over the layer of insulating blocks substantially embedding the outer arm portions of the anchor brackets in the refractory material for firmly anchoring both the layer of insulating blocks and the layer of refractory material to the metal wall of the kiln.

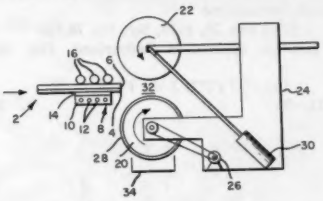
4,289,480

PROCESS FOR HEATING THIN SURFACE LAYERS

C. Bradford Jones, and Richard D. Kinard, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 2, 1979, Ser. No. 90,679
Int. Cl.³ F27B *9/28*
U.S. Cl. 432—8 **14 Claims**

1. A process for heating a thin surface layer of a thicker dielectric substrate without substantially heating the substrate mass which comprises advancing the exposed surface of the thin layer in surface-conforming contact with a continuously heated surface for 0.1 to one second at an interface pressure of



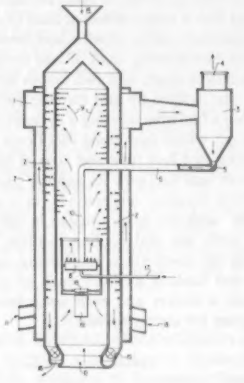
0.1 to 5 kilograms per centimeter of substrate width, the heated surface having an initial temperature of 35°–350° C.

4,289,481

FUEL AND APPARATUS FOR DRYING GRAIN

Robert A. Yano, Worthington, Ohio, assignor to Comet, Inc., Grand Island, Nebr.

Filed Jul. 6, 1979, Ser. No. 55,152
Int. Cl.³ F27D *1/08*
U.S. Cl. 432—96 **6 Claims**



1. A grain dryer having:

(a) three chamber means, the first of which has an outer shell which is intermediate of and spaced from that of each of the other two, the second of which is within the first chamber means, and the third of which surrounds a major portion of the first chamber means; a major portion of the outer shell of each of the first and second chamber means being perforated, whereas the outer shell of the third chamber means is impervious and extends beyond the perforated portion of the outer shell of the first chamber means;

(b) inlet means to introduce grain to be dried into the first chamber means and outlet means to withdraw from the same chamber means grain from which moisture has been removed, the inlet means and the outlet means being disposed at opposite ends of the first chamber means;

(c) grain-dust collecting means within the third chamber means and surrounding the first chamber means;

(d) means to conduct grain dust from the grain-dust collecting means to a grain-dust concentrating means; and

(e) means to convey grain dust concentrated in the grain-dust concentrating means into the second chamber means and through a moisture removal means to a burner means within said second chamber means.

4,289,482

FUEL LANCE STRUCTURE FOR A UNIFLOW REGENERATIVE SHAFT FURNACE

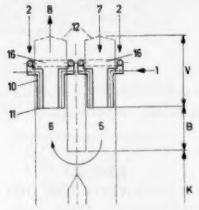
Erwin Füssl, Zürich, Switzerland, assignor to Maerz Ofenbau AG, Zürich, Switzerland

Filed Sep. 25, 1979, Ser. No. 78,765

Claims priority, application Switzerland, Feb. 28, 1979, 1963/79

Int. Cl.³ F27D *1/08*; F27B *15/00*

U.S. Cl. 432—96 **3 Claims**



1. Apparatus for calcining limestone and similar raw materials comprising: a uniflow regenerative shaft furnace fired with liquid fuel and including a pair of uninsulated fuel lances suspended in bulk quantities of said raw materials through which said liquid fuel is supplied and at least two shafts connected in flow communication by transfer duct means alternately operating one as the calcining shaft of said furnace and the other as the counterflow shaft, said fuel lances being located at a preheating zone defined by said furnace; each of said fuel lances comprising a fuel tube forming a cylindrical line for said liquid fuel through which said liquid fuel flows and a tubular jacket surrounding said fuel tube and coaxial therewith forming together with said fuel tube an annular gap therebetween; said lances being situated, respectively, in a different one of said two shafts, with the lance situated in the uniflow shaft being supplied with fuel and cooling medium and with the lance situated in the counterflow shaft being supplied with cooling medium and flushing medium; each of said shafts being provided with a blower and each lance being provided with a dosing pump for supplying fuel.

4,289,483

APPARATUS FOR THE MUTLI-STEP CALCINATION OF CEMENT-CLINKER

Herbert Deussner, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Division of Ser. No. 888,696, Mar. 21, 1978, Pat. No. 4,183,762. This application Sep. 4, 1979, Ser. No. 72,095

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1977, 2712238

Int. Cl.³ F27B *7/02, 3/04*

U.S. Cl. 432—106 **8 Claims**

1. An apparatus for the production of cement from raw material to the clinker stage which comprises:

a preheat heat exchanger means having means for receiving and heating raw material;

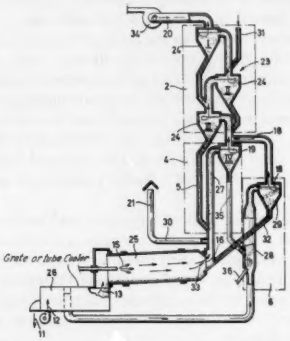
calcination heat exchanger means which comprise:

a precalcination stage means connected to receive material from said preheat heat exchanger, and

an after-calcination stage means with means for receiving material from said precalcination stage;

a gas inlet means for each of said calcination stages providing heated air therefor;

a fuel supply, burner, and air supply for supporting combustion of the burner for said after-calcination stage means of the calcination heat exchanger means; and



a fuel fired sintering kiln means connected to receive material from said after-calcination stage.

4,289,484

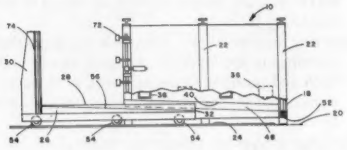
CAR BOTTOM FURNACE

Lawrence C. Lyman, Broadbrook, Conn., assignor to Industronics, Inc., South Windsor, Conn.

Filed Jan. 7, 1980, Ser. No. 109,927

Int. Cl.³ F27D *3/12*

U.S. Cl. 432—241 **8 Claims**



1. In a high temperature car bottom furnace having a furnace chamber including a pair of side walls and an end wall, and a car mounted furnace floor movable relative to said chamber between an open position spaced from said walls and a closed position operatively engaging said walls, the combination wherein said side walls have tapered bottom surfaces sloping toward said end wall, said surface floor has tapered sealing surfaces complementary to said bottom surfaces for mating with the bottom surfaces of the side walls to close the bottom of said furnace chamber, the sealing surfaces of said floor being in spaced confronting nonsealing relationship to said bottom surfaces during a major portion of the floor travel into its closed position, and a resilient compressible insulating layer secured to at least one of the mating surfaces along the full extent of each side wall for compressive engagement between said mating surfaces to seal said chamber along said side walls as the floor reaches its closed position.

4,289,485

SINTER MACHINE-PELLETIZING MACHINE WEAR AND BAFFLE PLATE FOR PALLET SIDE PLATE

Anthony A. Latowski, Pittsburgh, and William P. Grib, Belle Vernon, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

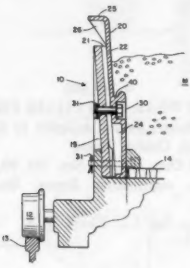
Filed Aug. 15, 1979, Ser. No. 66,551

Int. Cl.³ F27D *3/00*

U.S. Cl. 432—245 **4 Claims**

1. Traveling grate apparatus for treating materials at elevated temperature, comprising a grate and upstanding substantially rectangular side plates at each side of said grate along the

path of travel of the grate for cooperation with said grate to define a channel for carrying said material, each side plate having a J-shaped inner face to form a bench along the length of its inner face and intermediate the height thereof for holding



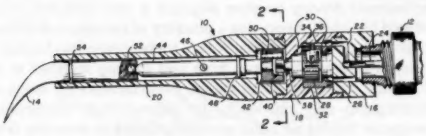
material so that, as the material changes in volume during the treating, it rests on said bench and provides a seal against the passage of gases along the interface of said side plate and material.

4,289,486

PNEUMATIC DENTAL SCALER

Roger E. Sargeant, Ashford, Conn., assignor to Innovate, Inc., Ashford Lake, Conn.

Filed Apr. 21, 1980, Ser. No. 142,097
Int. Cl.³ A61C *1/07*
U.S. Cl. 433—118 **8 Claims**



1. Dental apparatus comprising:

means for converting a flow of fluid to an output shaft rotation;

means for engaging and driving a dental tool, said driving means including a pivotally mounted elongated drive shaft, said drive shaft engaging a tool at its first end, said drive shaft first end being constrained by the pivot mounting to move linearly;

means for translating said converting means output shaft rotation to periodic movement of said driving means shaft about its pivot mounting, said translating means including an irregularly shaped member mounted on said converting means output shaft for rotation therewith, said translating means further including a contact member extending from the second end of said driving means shaft in juxtapositioned relationship to said irregularly shaped member; and

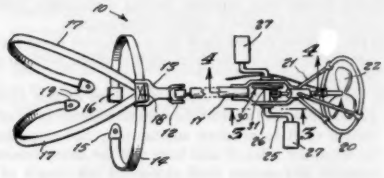
means resiliently biasing said driving means shaft to a position where there is clearance between said contact member and said irregularly shaped member during rotation of said irregularly shaped member, the application of force to the first end of said diving means shaft overcoming the resilient bias and causing said shaft to pivot whereby the second end of said shaft and said contact member are deflected and the portions of said irregularly shaped member having maximum radius will periodically engage said contact member to thereby urge said drive shaft against the resilient bias to impart vibratory motion to a tool engaged by the first end of said drive shaft.

4,289,487

SWIMMING DEVICE

Karl W. Fattler, 33-06 31st Ave., Long Island City, N.Y. 11106

Filed Sep. 19, 1979, Ser. No. 77,048
Int. Cl.³ A63B *35/10*
U.S. Cl. 440—31 **3 Claims**



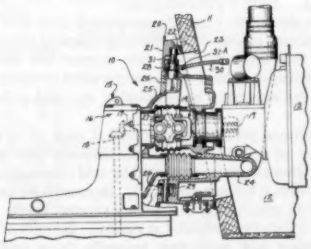
1. A swimming device, comprising in combination, a frame supported at its forward end on a waist belt, shoulder straps extending from the waist belt, a crankshaft rotatably positioned transverse to the frame, foot pedals located at opposing ends of the crankshaft, a first gear fixed onto said crankshaft and having a plurality of radially different speed controlling sections thereon, with the slower speed control section being radially inward of the faster control section, a propeller shaft extending from the rear end of said frame, a propeller fixed at the distal end to said propeller shaft, a second gear fixed at the medial end of said propeller shaft and engaging said first gear, a housing supported by said frame for protectively surrounding said propeller, biasing means for normally biasing said second gear to engage said first gear at the outermost speed control section thereof, said shaft, second gear and propeller being slidable together relative to said frame and housing in the direction of the shaft's axis, a collar formed on said propeller shaft, a hand operated rotatable winch formed on said waist belt, a cable extending from said winch and coupled to said collar, whereby the operator of said winch selectively moves the second gear against the bias to engage slower speed control sections of the first gear by winding said cable about said winch, said winch being constructed and arranged to maintain said second gear in a selected position without further restraint by the operator.

4,289,488

STERN DRIVE GIMBAL ARRANGEMENT

Robert B. Weronke, Oshkosh, and Herbert A. Bankstahl, Fond du Lac, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Feb. 21, 1979, Ser. No. 13,039
Int. Cl.³ B63H *25/42*
U.S. Cl. 440—57 **1 Claim**



1. A drive assembly for mounting on the transom of a watercraft, including

(A) a stern drive mounted externally of the watercraft;

(B) a gimbal housing attached to the watercraft;

(C) a gimbal ring member for pivotally attaching the stern drive to the gimbal housing for trim and steering control;

(D) a generally vertical steering swivel shaft pivotally attaching the gimbal ring member to the gimbal housing; and

(E) a steering lever attached to the upper portion of the steering swivel shaft to provide steering control of the drive unit;

wherein the improvement comprises:

(1) the gimbal ring member having a generally vertical bore with a generally square cross-section;

(2) the steering swivel shaft having a lower cross-section complementary to the cross-section of the vertical gimbal ring bore; and

(3) clamping means to clamp the sides of the vertical gimbal ring bore against the complementary sides of the swivel shaft to produce substantially full engagement between the sides of said bore and the complementary sides of said swivel shaft along the full length of the bore, said clamping means comprising:

(a) a slot in the gimbal ring extending diagonally through the cross-section of the gimbal ring bore, the slot lying in a plane including the axis of the gimbal ring bore and extending into the gimbal ring on both sides of the gimbal ring bore; and

(b) a bolt through the gimbal ring member on each side of the gimbal ring bore to force the sides of the slot together, with said bolts positioned offset toward the bottom of said gimbal ring bore to compensate for the bending of the gimbal ring as said bolts are tightened.

4,289,489

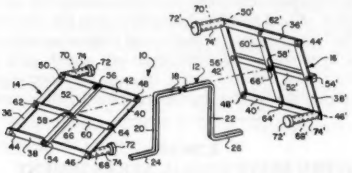
SELF-ADJUSTING VARIABLE SPEED IDLER PULLEY

Rudolph Moschetto, 264 86th St., Brooklyn, N.Y. 11209

Filed Dec. 19, 1979, Ser. No. 105,022

Int. Cl.³ F16H *55/54*

U.S. Cl. 474—52 **6 Claims**



1. Self-adjusting variable-speed idler pulley for guiding a power transmission element, which comprises:

a non-rotating pulley support shaft; and

two pulley side wall assemblies, each of said assemblies comprising:

four edge elements pivotally connected at their ends sequentially to form a parallelogram;

a side support bar pivotally connected at each of its ends to the center of one of an opposing parallel disposed pair of said four edge elements, said support bar having a centrally disposed bore of a configuration complementary to, and for mounting non-rotatably on, said pulley support shaft;

a cross-brace pivotally connected at each of its ends to the center of one of the parallely disposed pair of said four edge elements not connected by said side support bar, said cross-brace having a centrally disposed bore for mounting for free rotation on said pulley support shaft;

a pair of spindles mounted at opposite corners of said parallelogram and projecting inwardly from said side wall assembly in substantially parallel relationship to said pulley support shaft; and

a pair of sleeve members, one mounted for free rotation on each of said pair of spindles, said sleeve members adapted to carry and guide the power transmission element;

said two pulley side wall assemblies being mounted non-rotatably on said pulley support shaft in facing relationship, at an angular displacement of 45 degrees with respect to one another, so that said sleeve members on said spindles are aligned in a common plane and are disposed in changeable circular orbital relationship for guiding the power transmission element.

4,289,490

IMPROVED REAR HUB CHAIR PROTECTOR

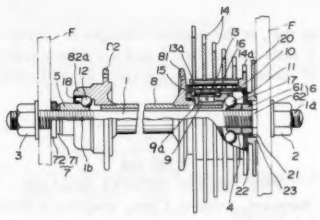
Masashi Nagano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 3, 1979, Ser. No. 99,483

Claims priority, application Japan, Dec. 9, 1978, 53-170078[U]

Int. Cl.³ F16H *7/18*

U.S. Cl. 474—144 **6 Claims**



1. In a rear hub for a bicycle, said hub comprising a hub shaft, a pair of bearings mounted to said hub shaft, a hub shell supported rotatably to said hub shaft through said bearings, a cylindrical driving member disposed at one axial end portion of said hub shell supporting a plurality of sprockets of different diameters, a unidirectional rotary transmission mechanism for transmitting driving force from said driving member to said hub shell, and a first and a second fixing member for fixing said bearings to said hub shaft, the improvement comprising a protector having an outer periphery larger in diameter than a first sprocket of said plurality of sprockets, said first sprocket being positioned at the axial outermost side of said hub shaft, said protector having at its center a fitting bore which fits onto said first fixing member, being arranged axially outwardly of said first sprocket and between it and a fork of a bicycle, and being supported to said first fixing member, said protector preventing a driving chain from disengaging from said first sprocket.

4,289,491

APPARATUS FOR ADHESIVELY BONDING A CARTON

Peter C. Collura, and Thomas R. Baker, both of Los Altos, Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Jun. 25, 1979, Ser. No. 51,854

Int. Cl.³ B31B *3/60*

U.S. Cl. 493—124 **14 Claims**

1. A carton blank feeding means for delivering a blank to a forming die comprising:

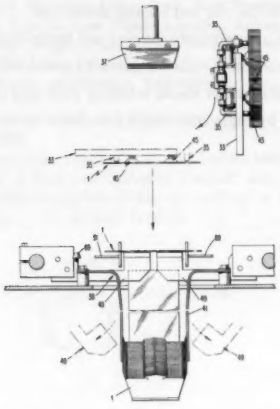
a movable frame;

at least one vacuum assisted suction cup mounted to said frame for lifting a carton blank from a stack;

means for moving said frame to transfer said carton blank carried by said suction cup from said stack into registration over said forming die and for pressing said carton blank into contact with said die, and

at least one adhesive applicator, connected to a pressurized

source of liquid adhesive, for applying a spot of said adhesive to a selected portion of said carton blank while held



on said movable frame and when said carton blank is pressed into contact with said die.

4,289,492

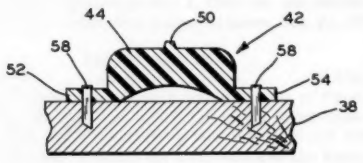
CREASING RULE

Jack R. Simpson, Toledo, Ohio, assignor to Container Graphics Corporation, Toledo, Ohio

Filed Jan. 9, 1980, Ser. No. 110,780

Int. Cl.³ B26D *3/08*

U.S. Cl. 493—371 **10 Claims**



1. A rotary cutting die for processing corrugated board, said die comprising a die plate, a creasing rule comprising an elongate, smooth, unbroken web of plastic material and having a central, longitudinally-extending ridge located on one side thereof, said web having longitudinally-extending flanges along each edge thereof and extending outwardly therefrom in opposite directions, said web having a shallow, longitudinally-extending groove centrally located on the side thereof opposite said ridge, and means for affixing said flanges to said die plate with the ridge extending outwardly therefrom.

4,289,493

APPARATUS FOR APPLYING AN OVERLAY TO A SUBSTRATE

Winfried Hedrich, Rahden, Fed. Rep. of Germany, assignor to Rahdener Maschinenfabrik August Kolbus GmbH & Co. KG, Wesphalia, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 95,093

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2850740

Int. Cl.³ B65B *49/12*

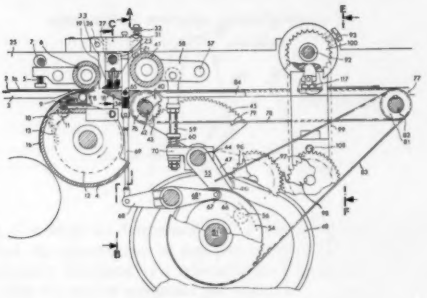
U.S. Cl. 493—389 **43 Claims**

1. Apparatus for wrapping flexible sheet material around a rectangular substrate which is advanced along a path, the sheet material being adhered to a first surface of the substrate and extending beyond the edges thereof, said apparatus comprising:

wrapping means for pressing the sheet material against a second surface of the substrate, said second surface being opposite to the first surface, said wrapping means being positioned at a fixed location along the path;

means for transporting the substrate and adhered sheet material to said wrapping means along the path, said transporting means being reversible whereby the substrate may first be fed to said wrapping means in a first direction and then fed back to said wrapping means in a second direction;

first means for deflecting sheet material extending beyond a first edge of the substrate out of the direction of move-



ment thereof prior to the feeding of the substrate and adhered sheet material to said wrapping means in the first direction whereby said sheet material will be engaged by said wrapping means and folded around a first edge of the substrate; and

second means for deflecting the sheet material extending beyond a second edge of the substrate out of the direction of movement imparted thereto by said transporting means prior to the feeding of the substrate and adhered sheet material to said wrapping means in the second direction whereby said sheet material will be engaged by said wrapping means and wrapped around the second edge of said substrate, the substrate second edge being disposed oppositely to said substrate first edge.

4,289,494

BRAKE FOR SHEET STACKS ON A FOLDING TABLE

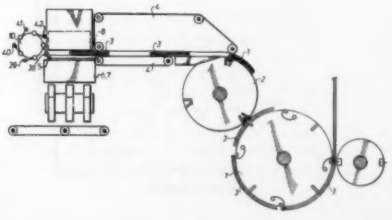
Hans B. Bolza-Schunemann, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Oct. 24, 1979, Ser. No. 87,839

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1978, 2846192

Int. Cl.³ B65H *45/00*

U.S. Cl. 493—405 **10 Claims**



1. A brake apparatus to slow-down and stop moving sheet stacks on a folding table of a web-fed rotary printing machine, said brake apparatus comprising:

a plurality of resiliently supported stop rods, each of said stop rods being disposed horizontally and generally perpendicular to the direction of movement of said sheet stacks, a leading edge portion of each of said sheet stacks contacting one of said stop rods to move said rod from a rest position;

a rotatable brake drum, means mounting each said rod on said brake drum for rotation therewith to slow-down and stop the forward movement of the sheet stacks on said folding table; means for resiliently biasing each said rod to allow it to move a distance with a stack of sheets wherein Kinetic energy is transferred from the braked stack of sheets to the rod and biasing means and

means for intermittently rotating said brake drum to position succeeding stop rods for contact by said leading edge of succeeding sheet stacks whereby each said sheet stack is braked by engagement with one of said resilient stop rods.

4,289,495

OXIDATIVE DYE COMPOSITIONS CONTAINING A 2,5-DIHYDROXYPHENYLALKANOIC ACID OR SALTS THEREOF AS ANTIOXIDANT

Andree Bugaut, Boulogne-Billancourt; Jean-Francois Grollier, Paris, and Jean-Jacques Vandenboosche, Aulnay-sous-Bois, all of France, assignors to L'Oreal, Paris, France

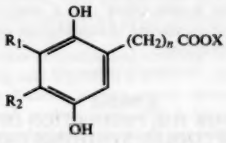
Filed Aug. 18, 1978, Ser. No. 934,830

Claims priority, application Luxembourg, Aug. 19, 1977, 77994

Int. Cl.[3] A01K *7/13*

U.S. Cl. 8—406 28 Claims

1. A composition suitable for dyeing human hair, consisting essentially of at least one oxidative dyestuff and, as anti-oxidant, a 2,5-dihydroxyphenylalkanoic acid or a salt thereof corresponding to the general formula:



(I)

in which R_1 and R_2 are identical or different and denote hydrogen or a straight- or branched-chain alkyl group of 1 to 4 carbon atoms, X denotes hydrogen, an alkali metal, ammonium, or an alkanolamine radical and n is an integer from 1 to 4.

4,289,496

FINISHING PROCESS

Gordon H. Lister, Leeds, England, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 510,470, Sep. 30, 1974, which is a continuation-in-part of Ser. No. 182,852, Sep. 22, 1971, abandoned. This application May 5, 1980, Ser. No. 146,442

Claims priority, application United Kingdom, Sep. 22, 1970, 45144/70

Int. Cl.[3] B08B *7/00*

U.S. Cl. 8—477 13 Claims

1. A low liquor ratio textile finishing process of the kind which comprises a step in which the textile is impregnated with a finishing liquor comprising finishing agent and water and a heating step in which the temperature of the textile is raised to a predetermined finishing temperature, the quantity of finishing liquor being such that the textile absorbs substantially all of the available liquor during the impregnation step, wherein the heating step comprises heating the impregnated textile to the predetermined finishing temperature while moving it in an atmosphere which is substantially or completely saturated with water vapor.

4,289,497

GRADIENT PHOTOCHROMIC LENS AND METHOD SELECTIVELY REDUCING PHOTOCHROMIC ACTIVITY

Richard J. Hovey, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sep. 2, 1980, Ser. No. 183,654

Int. Cl.[3] D06P *5/00*

U.S. Cl. 8—506 14 Claims

1. An optical element exhibiting gradient photochromic response comprising:

a synthetic plastic host,

a photochromic spiroindolinenaphthooxine dye, said dye being dispersed uniformly across at least one element surface, an ultra-violet radiation absorbing material, said material being capable of inhibiting activation of said photochromic dye and said material dispersed in greater concentrations in selected portions of the element whereby photochromic activity of the dyed lens varies with the concentration of said material.

4,289,498

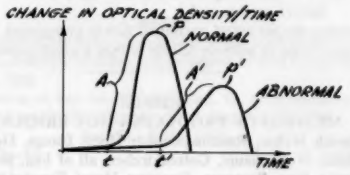
ONE-STAGE PROTHROMBIN ASSAY AND COMPOSITIONS USEFUL THEREIN

D. Joseph Baughman, Flemington, and Ann Lytwyn, New Brunswick, both of N.J., assignors to Ortho Diagnostics, Inc., Raritan, N.J.

Filed Jan. 8, 1979, Ser. No. 1,500

Int. Cl.[3] G01N *33/86*

U.S. Cl. 23—230 B 21 Claims



1. A method for determining, for a fibrinogen-normal individual, the effectiveness of that portion of the blood clotting mechanism measured by a conventional one-stage prothrombin time test which comprises the steps of:

(a) determining the exponential rate of thrombin formation in a mixture comprising effective thrombin-forming concentrations of thromboplastin, calcium ion, and test plasma from said individual; and

(b) comparing this determined rate to a compilation of rates for plasmas of known clotting properties.

4,289,499

SELECTING PERFLUOROCARBON COMPOUNDS FOR SYNTHETIC BLOOD

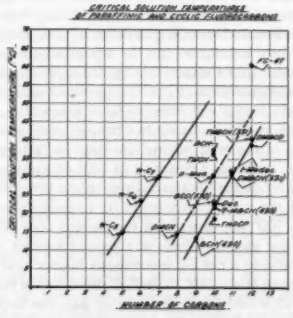
Leland C. Clark, Jr., Cincinnati, Ohio, and Robert E. Moore, Wilmington, Del., assignors to Childrens Hospital Medical Center, Philadelphia, Pa. and Suntech, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 81,584, Oct. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 950,959, Oct. 13, 1978, abandoned. This application Sep. 22, 1980, Ser. No. 189,509

Claims priority, application Japan, Oct. 12, 1979, 54-130953

Int. Cl.[3] A61K *31/02*

U.S. Cl. 23—230 B 5 Claims



1. A process for selecting perfluorocarbon compounds from those having from about 9 to 12 carbon atoms for preparing synthetic blood compositions comprising:

(a) dissolving a candidate perfluorocarbon compound in a solvent;

(b) determining the critical solution temperature of said candidate perfluorocarbon; and

(c) accepting the candidate perfluorocarbon compound for preparing a synthetic blood composition when said candidate compound has a critical solution temperature of less than;

(1) a first temperature when the perfluorocarbon has nine carbon atoms;

(2) a second temperature when the perfluorocarbon has ten carbon atoms;

(3) a third temperature when the perfluorocarbon has eleven carbon atoms;

(4) a fourth temperature when the perfluorocarbon has twelve atoms; and

whereby the accepted perfluorocarbon compound has a transpiration rate in animals falling within a predetermined range.

4,289,500

METHOD OF PRODUCING HOT BRIQUETTES

Heinrich Weber, Recklinghausen; Horst Dungs, Herne; Karl-Heinz Wollenhaupt, Gelsenkirchen, all of Fed. Rep. of Germany; Yves Brasseur, Strassen; Henri Birscheidt, Lintgen, both of Luxembourg, and Franz Beckmann, Alsdorf, Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,150

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916260

Int. Cl.³ C10L *5/16, 5/02*

U.S. Cl. 44—15 R **11 Claims**

1. A method of producing hot briquettes in a plurality of heating states, comprising heating a first quantity of coal components which do not soften by direct heat exchange with hot carrier gases to a temperature of about from 550° to 700° C., directing the heated coal components and gases into a first separator to separate the carrier gases from the heated first quantity of coal components, for subsequent use, preheating and drying a caking bituminous binder coal component with the separated carrier gas to a temperature ranging from 240° to 360° C., directing the heated binder coal component and the separated carrier gas to a second operator to provide a second separated carrier gas and heated and dried binder coal, directing the second separated carrier gas into direct heat exchange with a second quantity of said coal components at a temperature in the range of from 350° to 600° C., then directing the heated and predried second quantity of said coal components and the second separated carrier gas to a third separator to separate the second quantity of coal components from the second separated carrier gas, directing the separated second quantity of said coal components into heat exchange with the hot carrier gases in said first mentioned heating step, directing the separated first and second quantities of coal components of the first and third separators and the separated binder from the second separator into a mixer, mixing the separated binder and first and second quantities of coal components, and then directing the mixture into a roll press to form briquettes.

4. In a method of producing hot briquettes in a plurality of heating states of the type having the steps including, in a first heating stage, injecting a quantity of coal components, which do not soften by direct heat exchange, into a hot carrier gas to directly heat the coal components to a temperature ranging from 550° to 700° C., separating the heated coal components from the carrier gas, and then, in a second heating stage, preheating and drying a caking bituminous binder coal to a temperature ranging from 240° to 360° C. by directly heating said binder coal with said separated carrier gas, the improvement comprising the steps of reseparating the carrier gas from the heated binder coal, directly heating and predrying a second quantity of said coal components with said reseparated carrier gas, separating said heated second quantity of coal components from said reseparated carrier gas, and injecting said heated second quantity of coal components into said carrier gas in the first heating stage.

4,289,501

HYDROCARBON FUEL ADDITIVE

Eugene C. Medcalf, Bound Brook, N.J., assignor to BWM Corporation, Mount Vernon, N.Y.

Division of Ser. No. 890,552, Mar. 20, 1978. This application Apr. 21, 1980, Ser. No. 142,445

Int. Cl.³ C10L *1/20*

U.S. Cl. 44—56 **6 Claims**

1. A clear liquid composition stable below 0° C. which comprises:

(a) about 1,000 parts by volume of a hydrocarbon fuel suitable for use in an internal combustion engine; and

(b) from about 1 to about 2 parts by volume of a solution of a halogenated hydrocarbon and a compound selected from the group consisting of naphthalene and alkyl derivatives of naphthalene.

4,289,502

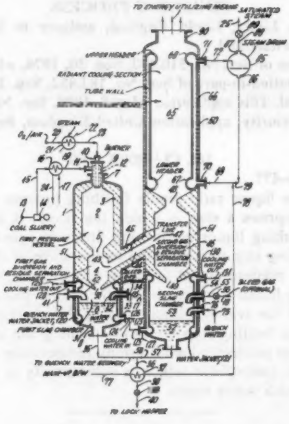
APPARATUS FOR THE PRODUCTION OF CLEANED AND COOLED SYNTHESIS GAS

James R. Muenger, Beacon; Edward T. Child, Tarrytown, and Albert Brent, Huntington, all of N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

Division of Ser. No. 43,918, May 30, 1979. This application Nov. 29, 1979, Ser. No. 98,457

Int. Cl.³ C10J *3/20*

U.S. Cl. 48—62 R **11 Claims**



1. An apparatus for continuously producing a high pressure stream of cleaned and cooled synthesis gas, reducing gas, or fuel gas comprising: a vertical cylindrical refractory lined pressure vessel containing a reaction zone comprising an unobstructed free-flow vertical cylindrical central passage, a top central inlet and a bottom central outlet; burner means mounted in said top inlet for introducing into said reaction zone reactant streams comprising solid carbonaceous fuel and free oxygen containing gas, with or without a temperature moderator; a thermally insulated first gas diversion and residue separation chamber with an upper central inlet connected to the bottom outlet of said reaction zone by way of a connecting passage; whereby the downflowing hot raw gas stream generated in said reaction zone and containing entrained residue comprising molten slag and particulate solids from the partial oxidation reaction in the reaction zone passes down through said connecting passage and expands into said first gas diversion chamber whose net internal volume is smaller than that of

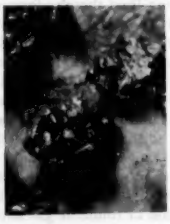
said reaction zone and where the velocity of the hot gas stream is reduced and a portion of said entrained residue is separated, a bottom central outlet means in said first gas diversion and residue separation chamber for discharging said separated portion of residue into a first slag chamber located below, and a side outlet from which exits about 80 to 100 vol. % of the hot raw gas stream less said separated portion of residue; a thermally insulated transfer line with the upstream end connected to the side outlet of said first gas diversion and residue separation chamber; thermally insulated second gas diversion and residue separation means whose net internal volume is greater than that of said first gas diversion and residue separation chamber and which is located in a separate vertical pressure vessel with a side inlet connected to the downstream end of said transfer line for receiving and changing the velocity of the hot gas stream and wherein a portion of the residue entrained therein is separated, said second gas diversion and residue separation means having an upper central outlet means for discharging 80 to 100 vol. % of the hot gas stream less said separated portion of residue and a bottom central outlet means for discharging said separated portion of residue into a second slag chamber located below; means defining a cylindrical vertical radiant cooling zone with a longitudinal free-flow unobstructed central passage, the lower portion of said radiant cooling zone being in communication with the upper central outlet means of said second gas diversion and residue separation means whereby hot gas from the second gas diversion and reside separation means is passed upward into the bottom of said radiant cooling zone where its velocity is reduced and where at least a portion of the residue entrained therein is separated by gravity, cooling means located along the inside wall of said radiant cooling zone for cooling by indirect heat exchange the hot gas passing upward through the radiant cooling zone, and upper outlet means for discharging cleaned and cooled synthesis gas, reducing gas, or fuel gas from said radiant cooling zone.

4,289,503

POLYCRYSTALLINE CUBIC BORON NITRIDE ABRASIVE AND PROCESS FOR PREPARING SAME IN THE ABSENCE OF CATALYST

Francis R. Corrigan, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Jun. 11, 1979, Ser. No. 47,656
Int. Cl.³ B24D *3/28*
U.S. Cl. 51—307 **39 Claims**



1. An improved process for making cubic boron nitride from hexagonal boron nitride powder which comprises subjecting hexagonal boron nitride to the high pressure-high temperature process:

(i) at a pressure from 55–80 kilobars;

(ii) at a temperature of 1600° C. to the reconversion temperature;

(iii) for a time sufficient to convert the hexagonal boron nitride to cubic boron nitride and sinter the cubic boron nitride; and

(iv) in the absence of catalysts and impurities which interfere with the conversion to cubic boron nitride or the sintering of cubic boron nitride;

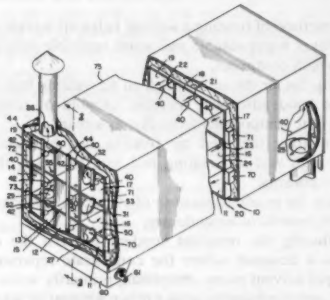
wherein the improvement comprises a pretreatment process consisting essentially of removing boric oxide from the surface of the hexagonal boron nitride powder—and generating a coating of boron on the surfaces of the oxide-free hexagonal boron nitride—before conversion to cubic boron nitride, which pretreatment is accomplished by a process carried out at a temperature in the hexagonal boron nitride thermal decomposition range and selected from vacuum firing and heating under inert atmosphere.

4,289,504

MODULAR GAS CLEANER AND METHOD

Addison B. Scholes, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 914,448, Jun. 12, 1978, abandoned.
This application Dec. 14, 1979, Ser. No. 103,433
Int. Cl.³ B03C *3/00*
U.S. Cl. 55—11 **6 Claims**



1. A method of removing wax-like particulate matter from a gas comprising:

introducing a gas with wax-like particulate matter to be removed into an inlet opening of a modular gas cleaner,

serially transporting all introduced gas to and fro through each passageway of a labyrinth comprising a plurality of generally horizontal passageways formed within the modular gas cleaner, each passageway having a small cross-sectional area and being formed by a plurality of electrically conductive partitions and including an opening at each end to force the introduced gas and particulate-like material into abrupt changes in direction in its to and fro transportation;

creating an electrostatic field and electrostatic forces between the electrically conductive partitions and electrodes centrally located within each passageway, said electrostatic field and electrostatic forces being generally transverse to the direction of gas flow and at least in part acting in the same direction as gravity, said electrostatic field having sufficient intensity to create ionization centrally of the flow path and to expose the gas and wax-like particulate matter being transported to ion bombardment within each passageway prior to passage through an outlet opening of the modular gas cleaner; and

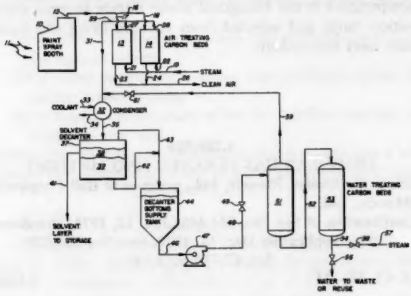
heating the flow path to assist in charging, deposition, and collection of the wax-like particulate matter and to place the wax-like matter in a fluid state so that it may be drained from within the modular gas cleaner by gravity through drain holes formed in the partitions of the gas cleaner.

4,289,505

SOLVENT RECOVERY FROM WATER

Leslie C. Hardison, Barrington; Joseph P. Eng, Schaumburg, and Gary J. Nagl, Roselle, all of Ill., assignors to Air Resources, Inc., Palatine, Ill.

Filed Jun. 13, 1980, Ser. No. 159,303
Int. Cl.³ B01D *53/06*; C02F *1/28*
U.S. Cl. 55—59 **6 Claims**



1. A method of treating a solvent laden air stream to remove and recover water soluble and water insoluble solvent components which comprises;

passing the air stream through an air treating bed of particulate solid adsorbent material capable of removing the solvent components from the air stream,

regenerating the used air treating bed by passing steam through said air treating bed and desorbing the solvent components,

passing the resultant mixture of steam and desorbed solvent components to a condenser,

introducing the resultant condensate from the condenser into a decanter where the condensate separates into an upper solvent phase comprising primarily water insoluble solvent components with a minor amount of water soluble solvent components and a lower water phase containing primarily water soluble solvent components,

passing said lower water phase through a water treating bed of particulate solid adsorbent material capable of removing the solvent component from the water phase,

regenerating the used water treating bed by passing steam through the bed and desorbing the solvent components,

recycling the resultant mixture of steam and desorbed solvent components from said water treating bed to said condenser, whereby to increase the relative content of water soluble solvent components in said lower water phase and also said upper solvent phase, and

withdrawing said upper solvent phase containing said water insoluble solvent components and the increased content of said water soluble solvent components.

5. Apparatus for treating a solvent laden air stream to remove and recover water soluble and water insoluble solvent components which comprises:

air treating means comprising at least one air treating bed of particulate solid adsorbent material capable of removing the solvent components from the air stream,

means for passing the air stream through said air treating bed,

means for periodically passing steam through said air treating bed and desorbing the solvent components,

a condenser,

means for passing a mixture of steam and desorbed solvent components from said air treating bed to said condenser,

a decanter,

means for introducing condensate from said condenser into said decanter where the condensate separates into an upper solvent phase comprising primarily water insoluble solvent components with a minor amount of water soluble solvent components and a lower water phase containing primarily water soluble solvent components,

water treating means comprising at least one water treating bed of particulate solid adsorbent material capable of removing the solvent components from the water phase,

means for passing the water phase from said decanter through said water treating bed,

means for periodically passing steam through said water treating bed and desorbing the solvent components,

means for recycling a mixture of steam and desorbed solvent components from said water treating bed to said condenser, and

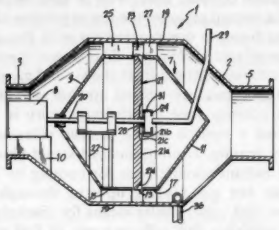
means for withdrawing said upper solvent phase from said decanter.

4,289,506

SCRUBBING APPARATUS

Arthur F. Stone, Marine View Plaza #1, Hoboken, N.J. 07030

Filed May 8, 1980, Ser. No. 148,041
Int. Cl.³ B01D *47/08*
U.S. Cl. 55—92 **78 Claims**



53. Apparatus for scrubbing a gas with a scrubbing fluid comprising rotatable impeller means having first and second axially displaced sections and an outer periphery, said first and second axially displaced sections being rotatable about a common axis and being located in first and second displaced parallel planes, scrubbing fluid supply means for supplying said scrubbing fluid to said first section of said rotatable impeller means, gas supply means for supplying said gas to be scrubbed to said second section of said rotatable impeller means, so that upon rapid rotation of said rotatable impeller means about said axis said scrubbing fluid and said gas are impelled outwardly from said first and second sections of said rotatable impeller means in said first and second displaced parallel planes, respectively, said scrubbing fluid thereby forming a rapidly rotating scrubbing fluid curtain at said outer periphery of said impeller means and in said first plane, and means for altering the direction of said gas as it flows rapidly outwardly from said second section of said rotatable impeller means out of said second plane so that said gas passes through said rapidly rotating scrubbing fluid curtain in a direction opposed to the direction of rotation of said scrubbing fluid in said first plane so as to scrub said gas with said scrubbing fluid.

58. A method of scrubbing a gas with a scrubbing fluid which comprises supplying said gas to a first location adjacent to the axis of rotation of rotatable gas impeller means, supplying said scrubbing fluid to a second location adjacent to the axis of rotation of rotatable scrubbing fluid impeller means including an outer periphery, said axes of rotation comprising a common axis, and said first and second locations being axially displaced from each other along said common axis, thereby causing said gas and said scrubbing fluid to pass radially outward from said first and second locations, respectively, in first and second axially displaced parallel planes by rapidly rotating both said rotatable gas and scrubbing fluid impeller means about said common axis of rotation, thereby forming a rapidly rotating scrubbing fluid curtain at said outer periphery of said scrubbing fluid impeller means in said second plane, and a flow of gas in said first plane, and altering the direction of said flow

of gas as it flows radially outward from said rotatable gas impeller means in said first plane so that said gas is diverted from said first plane to cross said second plane and thereby pass through said rapidly rotating scrubbing fluid curtain in said second plane in a direction opposite to that of the direction of flow of said scrubbing fluid.

4,289,507

EXPANSION TANK AND WATER BOX DEVICE FOR HEAT EXCHANGER, SUCH AS A RADIATOR OF A MOTOR VEHICLE

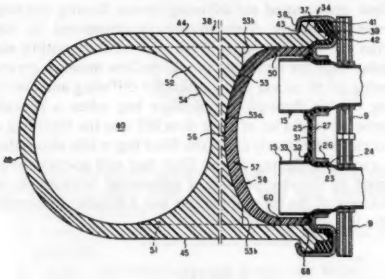
Patrick Cadars, Maurepas, and Bruno Hellouin di Cenival, Noisy le Roi, both of France, assignors to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Jun. 13, 1979, Ser. No. 48,249

Claims priority, application France, Jun. 15, 1978, 78 17966; May 18, 1979, 79 12783

Int. Cl.³ B01D *53/00*; F01P *5/10*

U.S. Cl. 55—195 **9 Claims**



1. In a heat exchanger including a plurality of substantially parallel heat exchanging tubes and a collector plate having a plurality of openings, each of said openings being traversed, respectively, by an end of one of said tubes for the purpose of mounting the same, the combination of:

(a) an expansion tank;

(b) said expansion tank having a peripheral edge portion sealingly connected to said collector plate;

(c) a water box housed inside said expansion tank, said water box comprising a partition separate from said expansion tank;

(d) said partition of said water box dividing the space in said expansion tank into a collector chamber and a compensation chamber;

(e) said collector chamber enclosing said tube ends adjacent to said collector plate;

(f) said compensation chamber being adjacent to said expansion tank;

(g) means for holding said water box in place between said expansion tank and said collector plate when said expansion tank and collector plate are sealingly connected; and

(h) said means for holding including ribs cooperating with said water box.

4,289,508

DEVICE FOR FILTERING AND FOR HUMIDIFYING THE ADMISSION AIR OF AN INTERNAL COMBUSTION ENGINE

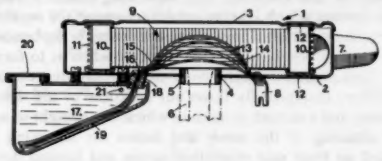
Ramon C. Robert, 16, avenue de Chatelaine, Geneva, Switzerland

Filed Apr. 28, 1980, Ser. No. 144,560

Claims priority, application Switzerland, May 4, 1979, 4184/79

Int. Cl.³ B01D *47/00*

U.S. Cl. 55—234 **3 Claims**



1. A device for filtering and humidifying the intake air of an internal combustion engine, comprising a casing including a top wall, bottom wall and side wall, an air inlet conduit in said side wall, an air outlet orifice in said bottom wall, a first filter in said casing in the flow path of intake air between said inlet conduit and said outlet orifice, a second filter comprising a plurality of absorbent material elements, a water tank attached to the outside of the bottom wall of said casing, conduit means connecting said tank to the interior of said casing, a portion of said second filter absorbent material elements disposed in said casing in the flow path of exit air, another portion of said absorbent material elements passing through said conduit means to said water tank and submersed therein to absorb water by capillary action and thereby humidify the air aspirated by said internal combustion engine.

4,289,509

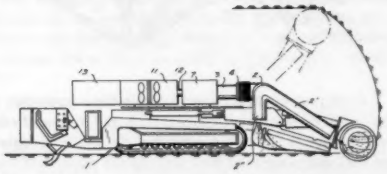
DUST ASPIRATING ARRANGEMENT

Heinz Hölter, Beisenstrasse 39-41, 4390 Gladbeck, Fed. Rep. of Germany

Continuation of Ser. No. 930,981, Aug. 4, 1978, abandoned. This application Sep. 5, 1979, Ser. No. 72,782

Int. Cl.³ B01D *47/06*; E21C *7/08*

U.S. Cl. 55—257 PV **14 Claims**



1. In combination with an underground machine tool, a dust aspirating arrangement comprising suction means for aspirating air which contains dust generated during operation of an underground machine having the tool, said suction means including an angled tubular element which has two portions each having an inlet arranged for aspirating the dust-containing air, said portions being arranged relative to one another so that one of said portions can aspirate dust in the region adjacent to the tool whereas the other portion can aspirate dust in the region of a floor whereto dust is advanced during operation; agglomerating means communicating with said suction means and arranged for receiving the dust-containing air aspirated by the latter, said agglomerating means being provided with a moisturizing element arranged for moisturizing said dust-containing air, and with a curved stationary wall portion

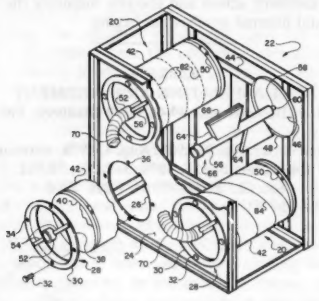
arranged for inducing the moisture and the dust-containing air toward a central region of said agglomerating means so as to produce a mixture, said curved stationary wall portion simultaneously reinforcing said agglomerating means; separating means communicating with said agglomerating means and operative for separating said mixture into its constituent dust-containing moisture and air, said separating means including a casing bounding a chamber which has a longitudinal axis, a frame member located in said chamber, and a plurality of blade members supported by said frame member, said frame member and thereby said blade members being inclined to said longitudinal axis of said chamber, said separating means having a flexible conduit which is arranged for removing the separated dust-containing moisture, said flexible conduit being bendable between a first position in which it is curved so as to form a siphon-type conduit through which the separated dust-containing moisture unimpededly flows but backflow of the same is prevented, and a second position in which it is straight so as to permit cleaning of the same; and means for removing the separated air from said separating means and located downstream of said flexible conduit.

4,289,510

INTERNAL LOADING CYLINDRICAL FILTER WITH UNSUPPORTED TUBULAR FILTER FABRIC

Marion E. Herndon, Jr., Matthews, N.C., assignor to Conor Corporation, High Point, N.C.

Filed Jan. 21, 1980, Ser. No. 113,453
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—294 **5 Claims**



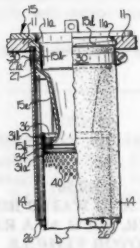
5. An internal loading cylindrical air filter apparatus comprising a pair of end plate members arranged in spaced relation to one another, a rotating cleaner nozzle means mounted between said end plate members for rotation about a horizontal axis in engagement with bearing means associated with said end plate members for said rotation and including at least one radially extending suction conduit, drive means for rotating said nozzle means, and a fabric filter element disposed in a generally circular tubular form to extend between said end plate members and about said rotating cleaner nozzle means and adjacent said radially extending conduit thereof, wherein the improvement comprises ring means for support of said filter element at the end thereof adjacent at least one of said end plate members, said ring means having means for retention thereof at said one of said end plate members and having annular means extending inwardly of said one of said plate members for said support of said filter element and means for attaching said filter element to said inwardly extending annular means during temporary disposition of said ring means exteriorly of said one end plate member.

4,289,511

BAG-TYPE FILTER APPARATUS WITH VENTURI-SUPPORTED AIR DIFFUSER

Allen S. Johnson, Jr., P.O. Drawer 1037, Salisbury, N.C. 28144

Continuation-in-part of Ser. No. 76,605, Sep. 18, 1979, Pat. No. 4,231,770. This application Jul. 23, 1980, Ser. No. 171,350
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—302 **14 Claims**



1. In a filter apparatus of the type wherein a particulate-laden gas is directed through a filter bag for filtering and retaining the particulate material on the exterior of the bag, wherein the filter bag has an outlet end communicating with a tubular venturi extending into the filter bag for discharge of the filtered gas therethrough, and wherein the filter bag is cleaned by a periodic reverse flow of a jet of air into the venturi and into and through the filter bag, and further wherein the filter bag is supported by a tubular cage positioned within the filter bag, the combination therewith of

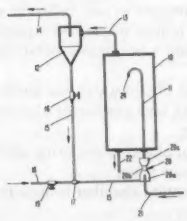
a hollow open-ended air diffusing means having openings therein and being communicatively connected to, supported by and extending from said venturi within said tubular cage for receiving in said hollow means a reverse flowing jet of air via said venturi for diffusing and distributing the air throughout the filter bag when a periodic reverse flow of a jet of air is directed into the filter bag so as to more effectively clean the filter bag while also reducing excessive flexing of the filter bag and abrasive wear thereof to thereby provide a substantial increase in the efficiency of the filter apparatus and a significant increase in the life of the filter bag.

4,289,512

HIGH PRESSURE SEPARATION DEVICE

Bernard Levresse, Lillebonne, France, assignor to Societe Chimique des Charbonnages-CdF Chimie, Paris, France

Filed Dec. 28, 1978, Ser. No. 973,940
Claims priority, application France, Dec. 28, 1977, 77 39506
Int. Cl.³ B01D *50/00*; C08F *6/10*
U.S. Cl. 55—315 **12 Claims**



1. A device for separating a high pressure polyphase mixture consisting of a gas charged with liquid particles, said device comprising:

(a) vertical cylindrical separator enclosure means for ex-

panding said polyphase mixture and separating said mixture into a gas and a liquid phase, said means having an outlet at its lower end for discharging separated liquids therefrom;

(b) vertical cyclone means in communication with said enclosure means for receiving separated gases therefrom, said cyclone means having a gas outlet at its upper end for discharging separated gases therefrom and a liquid outlet at its lower end for discharging separated liquids therefrom; and

(c) means for supplying the polyphase mixture to said vertical enclosure means, said means comprising

(i) an ejector comprising a nozzle through which the polyphase mixture is fed to increase its speed, a mixing zone connected to the liquid outlet of the cyclone means for entraining the separated liquids from said cyclone means in the polyphase mixture, and a diffuser section for reducing the speed of the resultant mixture, and

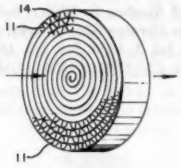
(ii) means connected to said diffuser section and opening into said enclosure means.

4,289,513

ACTIVATED SORBTION PAPER AND PRODUCTS PRODUCED THEREBY

Richard D. Brownhill, and Darcy B. Wilkinson, Jr., both of Lee, Mass., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 27, 1978, Ser. No. 890,181
Int. Cl.³ B01D *53/02, 53/04*
U.S. Cl. 55—387 **3 Claims**



1. A sorbtion device comprising the combination of:

(a) a fibrous paper base material, said base material being resiliently flexible and being characterized by:

(i) being substantially free of loose, activated sorbtion particles;

(ii) being substantially free of lumps and holes;

(b) activated sorbtion particles suitable for sorbtion of gaseous materials being dispersed in said fibrous paper base material, said sorbtion particles being selected from the group consisting of activated charcoal and activated silica, said activated sorbtion particles being substantially uniformly dispersed throughout all dimensions of said fibrous paper base material, said activated sorbtion particles being present in an amount of up to about 85 percent based on the weight of said base paper material, said particles being characterized by:

(i) a particle size of less than about 1000 microns;

(ii) an activation rating of less than about 250 percent;

(iii) the ability to be self-regenerable;

(c) a latex type binder material to bind said activated sorbtion particles to said fibrous base paper material, said binder material being substantially free of starch, said binder material being compatible with the sorbtion activity of said sorbtion paper;

(d) said fibrous paper base material being configured as an apertured structure characterized by a cross-sectional aperture density of from about 25 per square inch to about 400 per square inch; said apertured structure being further characterized by creating substantially linear, uniform parallel flow tunnels for gaseous streams passing through said apertures; said apertured structure being sized appropriately for lodging in the housing of air filtration means found on internal combustion engines; and

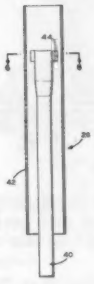
(e) air filtration means usable in combination with said apertured structure to provide an air filtration system for use in conjunction with an internal combustion engine whereby air entering and leaving said internal combustion engine is subjected to filtration, absorption and adsorbtion forces.

4,289,514

STACKED RE-ENTRANT ARM VAPOR-LIQUID SEPARATOR

Hudson R. Carter, Alliance; John H. Kidwell, Louisville, and William P. Prueter, Alliance, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 25, 1980, Ser. No. 162,717
Int. Cl.³ B01D *45/12;* **F22B** *37/32*
U.S. Cl. 55—398 **2 Claims**



1. A liquid-vapor separator device comprising: a vertically disposed cylindrical drum concentric with and in spaced surrounding relationship with a riser, forming an annulus therewith, and having means for discharge of a separated liquid at its lower end and means for discharge of a separated vapor at its upper end, the riser serving as a conduit for a two-phase flow of a fluid, open at its lower end to admit a liquid-vapor mixture and closed at its upper end, the riser being formed of upper and lower sections interconnected by a frusto-conical section, the upper section having an internal diameter greater than that of the lower section, a first plurality of curved arms radially disposed at the upper section of the riser, one end of each arm extending within the riser and in flow communication therewith, the opposite end of each arm extending into the annulus for discharge of the fluid and a second plurality of curved arms below the first plurality of arms and contiguous thereto.

4,289,515

PRODUCTION OF NITROGEN BY AIR SEPARATION

James D. Yearout, 270 Portofino Way #303, Redondo Beach, Calif. 90277

Filed Aug. 15, 1980, Ser. No. 178,294
Int. Cl.³ F25J *3/04*
U.S. Cl. 62—13 **18 Claims**

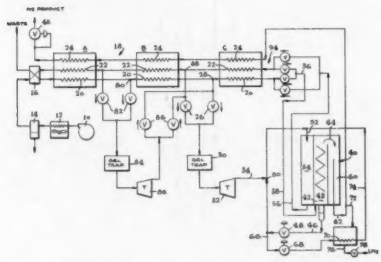
1. A process for the separation of nitrogen from air, which comprises:

compressing feed air containing water vapor and CO_2, to relatively low pressure,

passing the compressed feed air stream through a first passage of a reversing heat exchanger in heat exchange relation with an oxygen-rich waste stream passing through a second passage of said heat exchanger, whereby water vapor and CO_2 in the feed air are frozen on a surface of said first heat exchange passage,

reversing the two streams whereby the oxygen-rich waste stream flows through said first passage and said feed air

stream flows through said second passage, causing sublimation or evaporation of said water vapor and said CO_2,
at the end of this cycle, again reversing the two streams so that the compressed feed air stream passes through said first passage and the oxygen-rich waste stream passes through said second passage, and repeating the cycle at predetermined intervals,
withdrawing a portion of the feed air stream at an intermediate point in the heat exchanger,
expanding said withdrawn portion of feed air in an expander and discharging cooled expanded air,
withdrawing the remainder of said cooled feed air stream from the cold end of said heat exchanger after complete passage therethrough,
passing said cooled feed air stream upwardly in a fractionating column of a fractionating device, whereby oxygen-rich liquid is condensed, and a nitrogen overhead is produced,
withdrawing said oxygen-rich liquid from said fractionating column,



throttling said withdrawn oxygen-rich liquid to lower pressure and mixing the throttled liquid with said cooled expanded air discharged from said expander,
passing said mixture and said nitrogen overhead through separate passages in said fractionating device in countercurrent heat exchange relation with the feed air in said fractionating column, and withdrawing heat from said column,
withdrawing said mixture from said fractionating device and passing said mixture forming said waste oxygen-rich stream into the cold end of said heat exchanger through one of the first and second passages of the reversing heat exchanger as aforesaid,
said heat exchange in said reversing heat exchanger and said fractionation being carried out under conditions such that there is only a small temperature difference between the waste oxygen-rich stream entering the cold end of the exchanger and the cooled feed air stream exiting the cold end of the heat exchanger.

4,289,516
LOW LOSS OPTICAL FIBERS
David A. Krohn, Hamden, Conn., assignor to EOTEC Corporation, West Haven, Conn.
Filed Oct. 4, 1979, Ser. No. 81,771
Int. Cl.³ C03C *25/02*
U.S. Cl. 65—3 A **6 Claims**

1. A process for making an optical fiber, said process utilizing a crucible having a bottom with an orifice therein, said process comprising the step of:
melting a core material having a first refractive index;
drawing a cane of said core material from said aperture and through the interior of a tube composed of cladding material having a refractive index less than the refractive index of said batch material; and
drawing one end of said tube simultaneously with said cane so that an optical fiber is formed having a core composed of said core material and a cladding composed of said cladding material, said drawn tube end being heated sufficiently to cause said cane and said tube to fuse at their interface.

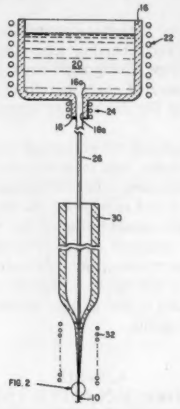
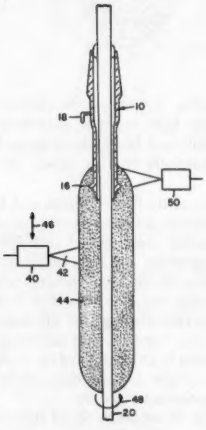


FIG. 2

4,289,517
METHOD OF FORMING AN OPTICAL WAVEGUIDE PREFORM
Alan C. Bailey, and Stephen B. Miller, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Jul. 3, 1980, Ser. No. 165,650
Int. Cl.³ C03B *19/06, 37/025*
U.S. Cl. 65—3 A **12 Claims**



1. A method of forming a preform suitable for optical waveguides comprising the steps of
providing a hollow longitudinal preform handle defining a longitudinal aperture and having one end thereof tapered and of diminishing wall thickness for the length of said taper, and an outwardly extending protrusion adjacent said taper,
inserting a starting mandrel through said handle so that said mandrel extends beyond said handle, and
depositing particulate material over at least a portion of said mandrel and over said one end of said handle including said protrusion, whereby said particulate material com-

prises said preform and said protrusion is embedded therein.

4,289,518

GLASS FIBERIZATION BY CENTRIFUGAL FEED OF GLASS INTO ATTENUATING BLAST

Jean A. Battigelli, and Francois Bouquet, both of Rantigny, France, assignors to Saint-Gobain Industries, Cedex, France

Division of Ser. No. 26,617, Apr. 6, 1979, Pat. No. 4,203,745. This application Nov. 6, 1979, Ser. No. 91,838
Claims priority, application France, Dec. 8, 1978, 78 34616
Int. Cl.³ C03B *37/04*
U.S. Cl. 65—15 **2 Claims**

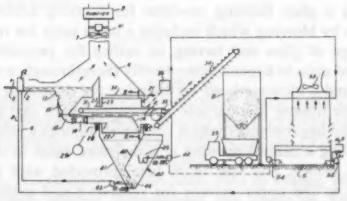
1. A hollow glass fiberizing spinner having a peripheral wall with a plurality of rows of orifices for centrifugal projection of streams of molten glass, characterized in that the spinner has a peripheral wall of thickness toward the lower edge portion thereof which is greater than the thickness in a region above the lower edge portion, the peripheral wall of the spinner being thickest at the lower edge, thinnest in an intermediate region and of intermediate thickness at the upper edge.

4,289,519

METHOD OF DEWATERING GRANULATED-SLAG SLURRY

Guido Monteyne, Lembeke, Belgium, assignor to SIDMAR Maritieme Staalnijverheid NV., Siderurgie Maritime S.A., Gent, Belgium

Continuation-in-part of Ser. No. 29,076, Apr. 11, 1979, Pat. No. 4,204,855. This application Jan. 7, 1980, Ser. No. 110,253
Claims priority, application Luxembourg, Apr. 18, 1978, 79466
The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.
Int. Cl.³ C03B *37/00*
U.S. Cl. 65—19 **8 Claims**



1. A method of treating a stream of molten slag, said method comprising the steps of continuously and concomitantly:
granulating said stream of molten slag with water to produce a granulated-slag/water slurry;
feeding said slurry at a relatively low location onto the inside surface of an endless and annular foraminous substrate;
rotating said substrate to lift said slurry to a relatively high location so that water runs off through said substrate and said slag is dewatered;
dropping the dewatered granulated slag from said substrate at said high location onto a conveyor within said annular substrate; and
transporting the dewatered slag with said conveyor away from said substrate.

4,289,520

METHOD AND APPARATUS FOR BENDING GLASS SHEETS

Nelson P. Bolton, Quakertown, Pa., assignor to Advanced Glass Systems Corporation, Quakertown, Pa.

Filed Dec. 17, 1979, Ser. No. 104,324
Int. Cl.³ C03B *23/03*
U.S. Cl. 65—104 **11 Claims**

1. A method of bending glass sheets into cylindrical or conical shapes, comprising the steps of:
(a) placing said sheet to be bent against a form conforming to the desired curvature;
(b) heating said sheet to its softening point; (c) exerting a force on at least two contact points on said sheet in a direction tangential to curves followed by said at least two contact points as said sheet is deformed, said force being exerted, and said at least two contact points being substantially unchanged with respect to said sheet, as said sheet is bent to conform to said form; and,
(d) cooling said sheet to a point below its softening point.

4. An apparatus for bending a glass sheet into a desired cylindrical or conical shape, comprising:
(a) a form rigidly mounted on a platform, said form having an axis, and said form conforming to said desired shape;
(b) a shaft rigidly mounted on said platform by a first end, said shaft disposed parallel to said axis of said form;
(c) two or more forming members having contact portions thereon and hingeably disposed on said shaft, said shaft displaced from said form at a distance such that contact between said forming portions and said glass sheet remains substantially unchanged with respect to the glass sheet as the glass is bent into the desired shape;
(d) means for exerting a force on said forming members against said glass sheet; and,
(e) means for heating said glass sheet.

4,289,521

APPARATUS FOR PRODUCING A FOAMED-GLASS OR FOAMED-CERAMIC STRIP

Konrad Schymura, Oberursel, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 6, 1980, Ser. No. 118,930
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907363
Int. Cl.³ C03B *19/08*
U.S. Cl. 65—144 **8 Claims**

1. An apparatus for producing a shaped body of foamed glass or foamed ceramic from a foamable material, comprising:
a tunnel furnace adapted to heat said material to induce foaming and produce said body from said material;

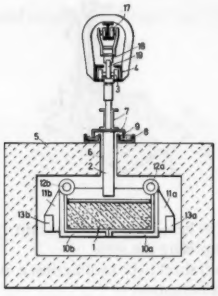
a track having a stretch disposed above said furnace, said furnace having a slot extending below said track;

a plurality of openended molds adapted to receive said material and alignable in end-to-end substantially abutting relationship in said furnace, the bottom of each mold being laterally swingable to open downwardly;

a respective trolley assigned to each mold and riding on said track;

hanger means including at least one hanger suspending each mold from the respective trolley and extending through said slot;

respective spacers connected to each hanger means shaped from the respective molds and adapted to about one another upon alignment of said molds to limit the force transmitted from mold to mold;



a pusher adapted to displace said molds into said furnace at a feed end thereof and effective to apply force in line with said spacers;

means forming a moving seal between said hangers and said furnace to substantially block said slot;

means downstream of said furnace along said path for swinging said mold bottoms laterally to open the molds downwardly;

means along said path for effecting relative vertical separation of the molds and said strand to remove said strand from said molds through the bottoms thereof;

means for severing the strand removed from said molds into blocks; and

means for returning molds from which said strand has been removed to said feed end of said furnace.

4,289,522

SUPPORT MEMBER FOR AN OPTICAL WAVEGUIDE PREFORM

Alan C. Bailey, and Stephen B. Miller, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,649
Int. Cl.³ C03B *19/06, 37/025*
U.S. Cl. 65—144 **6 Claims**

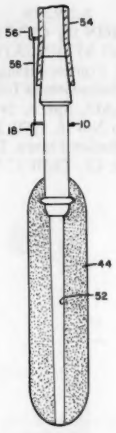
1. An article comprising

a hollow tubular member defining a substantially longitudinal aperture; said member having one end thereof tapered and of substantially diminishing wall thickness for the length of said taper, an outwardly extending protrusion disposed adjacent said one tapered end of said member,

first means for providing a substantially gas-tight connection to said member disposed at the end of said member opposite said one end whereby a gaseous medium may be flowed through said member,

second means intermediate said protrusion and said opposite end for securing said member to a source of gaseous medium, and

a porous soot preform of desired shape and size disposed from a point intermediate said outwardly extending protrusion and said second means and extending beyond said one tapered end of said hollow tubular member, said



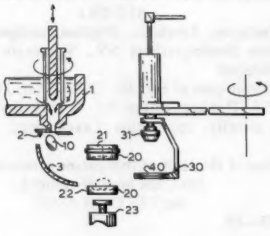
porous soot preform being rigidly affixed to said hollow tubular member.

4,289,523

WORK TABLES IN APPARATUS FOR BLOWING HOLLOW GLASS ARTICLES

Takeyoshi Murakawa; Tetsuo Sakamoto, both of Shiga, and Yutaka Oka, Otsu, all of Japan, assignors to Nippon Electric Glass Company, Limited, Otsu, Japan

Filed Mar. 7, 1980, Ser. No. 127,948
Int. Cl.³ C03B *7/16*
U.S. Cl. 65—172 **3 Claims**



1. In a glass forming machine for forming hollow glass articles by blowing which includes a work table for receiving a charge of glass and having an orifice for permitting said received glass to depend downwardly therethrough, a blowing mold, and a blowing head for blowing the depended glass to form the hollow glass article cooperating with said blowing mold; the improvement which comprises an orifice plate member having a central opening of a diameter equal to that of a desired orifice, and said work table provided with a recess formed in the upper surface for receiving said orifice plate member therein and with a hole larger than said orifice formed at the center of said recess, the outer contour of said recess being similar to, and slightly larger than, said orifice plate member to form a gap along the circumference of said orifice plate member at room temperature, said gap being sufficient to permit said orifice plate member to loosely fit in said recess but to be filled up by the thermal expansion of said orifice plate member due to the contact with the delivered charge of glass

of an elevated temperature to fix said orifice plate member to said work table.

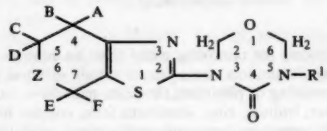
4,289,524

HERBICIDAL 3-(TETRAHYDROBENZOTHIAZOL-2-YL)TETRAHYDRO-1,3,5-OXADIAZIN-4-ONES

Benjamin A. Belkind, Skokie, Ill., assignor to Velsicol Chemical Coporation, Chicago, Ill.

Filed Oct. 1, 1979, Ser. No. 80,883
Int. Cl.³ A01N *43/78*; C07D *273/04*
U.S. Cl. 71—90 **9 Claims**

1. A compound of the formula



wherein R^1 is seleced from the group consisting of hydrogen and alkyl; Z is —CHR^2—; R^2 and R^3 are selected from the group consisting of hydrogen and alkyl; A, C and E are each independently selected from the group consisting of C1–C10 alkyl and hydrogen; B,D and F are each independently selected from the group consisting of C1–C10 alkyl, C3–C10 alkenyl, C4–C10 alkynyl, cycloalkyl, alkoxy, alkylthio, amino, cyano and hydrogen.

4,289,525

SOLID COMPOSITIONS OF A PYRAZOLIUM SALT, UREA AND A LIQUID SURFACTANT

Nunzio R. Pasarela, Bridgewater, and Choong-Gook Jang, Princeton, both of N.J., assignors to American Cyanamid Co., Stamford, Conn.

Filed Jul. 18, 1979, Ser. No. 58,711
Int. Cl.³ A01N *43/56*
U.S. Cl. 71—92 **6 Claims**

1. A solid, particulated herbicidal composition, comprising: a ternary molecular solution of from 10% to 30% by weight of octylphenoxy polyethoxy ethanol, 33% to 66% by weight of 1,2-dimethyl-3,5-diphenylpyrazolium salt and urea in amounts sufficient to adjust the weight of said composition to 100%; and wherein the above articulated herbicidal composition may optionally coated with a fumed synthetic silica or precipitated silica having a particle-size range of 0.015 micron to 2 microns and used in amounts of 1% to 5% by weight of said composition to be coated.

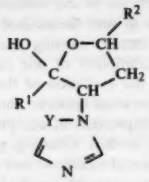
4,289,526

HETEROCYCLIC COMPOUNDS, PROCESSES FOR THEIR PREPARATION, PESTICIDAL COMPOSITIONS CONTAINING THEM AND METHODS OF COMBATING PESTS

Paul A. Worthington, Maidenhead; Paul de Fraine; William G. Rathmell, both of Workingham, and Diana M. Gatehouse, Maidenhead, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jun. 20, 1980, Ser. No. 161,558
Claims priority, application United Kingdom, Jul. 12, 1979, 24302/79
Int. Cl.³ A61K *31/41, 31/555*; C07D *405/04*; C07F *15/02*
U.S. Cl. 71—92 **7 Claims**

1. A compound having the formula:



wherein each of R^1 and R^2, which may be the same or different, is unsubstituted cycloalkyl of from 3 to 6 carbon atoms or such cycloalkyl substituted with alkyl group of from 1 to 5 carbon atoms; or unsubstituted alkyl of from 1 to 5 carbon atoms or such alkyl substituted with from 1 to 3 halogen atoms; or unsubstituted phenyl or phenyl substituted with halogen or alkyl, alkoxy, haloalkyl, or hydroxyalkyl of from 1 to 4 carbon atoms, phenyl, halophenyl, cycloalkyl of from 3 to 6 carbons, nitro, cyano, hydroxy, amino, phenoxy or benzyloxy, Y is=N—; and alkanoate ester, alkyl, aryl or aralkyl ethers, acid addition salts and copper, zinc, manganese or iron complexes thereof.

5. A composition for combating fungi and regulating plant growth comprising as an active ingredient, an effective amount of a compound as claimed in claim **1** and a carrier for the active ingredient.

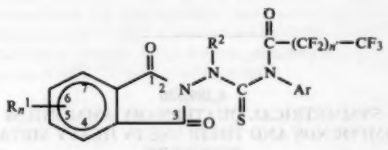
4,289,527

PLANT GROWTH REGULATING PERFLUOROACYL ARYLTHIOUREIDO ISOINDOLEDIONES

Loren W. Hedrich, Orange, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 4, 1980, Ser. No. 175,000
Int. Cl.³ A01N *43/38*; C07D *209/48*
U.S. Cl. 71—96 **28 Claims**

1. The method of regulating the growth of plants comprising applying to the plants, the seed or the soil an effective amount of a compound of the structural formula:



R^1 is C_1 to C_4 alkyl, nitro or halo and n is zero or an integer from 1 to 4;

R^2 is hydrogen, C_1 to C_4 alkyl, allyl or benzyl; n' is zero, 1 or 2 and Ar is naphthyl, phenoxybenzyl, phenyl or phenyl bearing thereon from one to three of the substituents: cyano, phenoxy, nitro, bromo, chloro, fluoro, and C_1 to C_4 alkyl, alkenyl, alkoxy, alkylthio, carbalkoxy or alkyl-substituted amino.

4,289,528

PROCESS FOR BENEFICIATING SULFIDE ORES

James K. Kindig, Arvada, and Ronald L. Turner, Golden, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 921,582, Jul. 3, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,902
The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.
Int. Cl.³ C22B *1/00*
U.S. Cl. 75—1 R **57 Claims**

1. In a process for the beneficiation of a sulfide ore from the gangue, excluding coal, wherein the ore is treated with a metal containing compound under conditions which cause the metal

containing compound to react substantially at the surface of the metal sulfide particles to the substantial exclusion of the gangue particles so as to alter the surface characteristics of the metal sulfide values thereby causing a selective enhancement of the magnetic susceptibility of one or more metal sulfide values of the ore to the exclusion of the gangue in order to permit a physical separation between the metal sulfide values and the gangue, the improvement comprising:

cotreating the ore with a reducing gas during the metal containing compound treatment and wherein the reducing gas used in the cotreatment is in addition to any reducing gas which may be produced from the metal containing compound treatment.

4,289,529

PROCESS FOR BENEFICIATING SULFIDE ORES

James K. Kindig, Arvada, and Ronald L. Turner, Golden, both of Colo., assignors to Hazen Research, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 950,175, Oct. 10, 1978, abandoned. This application Dec. 11, 1979, Ser. No. 102,626

The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.

Int. Cl.³ C22B *1/00*

U.S. Cl. 75—1 R **63 Claims**

1. In a process for the beneficiation of a sulfide ore from gangue, excluding coal, wherein the ore is treated with a metal containing compound under conditions which cause the metal containing compound to react substantially at the surface of the metal sulfide particles to the substantial exclusion of the gangue particles so as to alter the surface characteristics of the metal sulfide values thereby causing a selective enhancement of the magnetic susceptibility of one or more metal sulfide values of the ore to the exclusion of the gangue in order to permit a physical separation between the metal sulfide values and the gangue, the improvement comprising:

treating the ore with heat prior to its treatment with the metal containing compound.

4,289,530

SYMMETRICAL QUATERNARY AMMONIUM COMPOUNDS AND THEIR USE IN HEAVY METALS RECOVERY

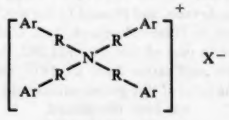
Guy A. Rich, Chicago, Ill., assignor to Albee Laboratories, Inc., Chicago, Ill.

Filed Jan. 18, 1980, Ser. No. 113,279

Int. Cl.³ C22B *11/04*

U.S. Cl. 75—101 BE **10 Claims**

1. The process for recovering heavy metals from solution comprising passing the metals containing solution through a bed of absorbing substrate having deposited thereon an effective amount of a quaternary ammonium compound of the formula



wherein each Ar is identical and is a phenyl or a condensed polynuclear aryl group having 2 to 4 aryl nuclei, each R is identical and is an alkyl of 1 to 4 carbon atoms, and X is a halogen.

4,289,531

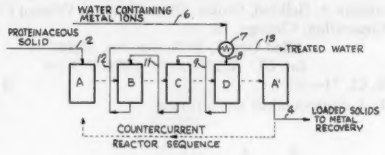
PROCESS FOR RECOVERING PRECIOUS METALS

Hubert A. Lechavelier, Piscataway, and Walter Drobot, Montclair, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Feb. 12, 1980, Ser. No. 120,801

Int. Cl.³ C22B *11/04, 15/00, 19/00, 23/00*

U.S. Cl. 75—101 BE **11 Claims**



1. A process for removing metal from an aqueous medium containing in solution one or more metals selected from the group consisting of platinum, rhodium, palladium, ruthenium, gold, silver, iridium, zinc, aluminum, iron, copper, nickel and tin which comprises contacting said aqueous medium with at least one unmodified proteinaceous material selected from the group consisting of feathers, hair, hoof meal and horn meal for a period of time sufficient to convert metal in solution to water insoluble form in association with said proteinaceous material, and separating loaded proteinaceous material containing removed metal from the resulting treated aqueous medium.

4,289,532

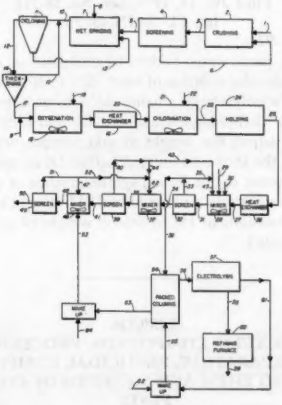
PROCESS FOR THE RECOVERY OF GOLD FROM CARBONACEOUS ORES

Raphael F. Matson, and Bernard M. Fisher, both of New Orleans, La., assignors to Freeport Minerals Company, New York, N.Y.

Continuation-in-part of Ser. No. 99,565, Dec. 3, 1979, abandoned. This application Feb. 29, 1980, Ser. No. 125,926

Int. Cl.³ C22B *11/08*

U.S. Cl. 75—105 **6 Claims**



1. In a process for the recovery of gold values from carbonaceous gold-containing ores by contacting an aqueous slurry of said ores with a cyanide complexing agent for the gold values, the improvement which comprises:

(a) forming said aqueous slurry of said ores in the presence of a soluble alkaline material;

(b) subjecting said aqueous slurry to oxidation comprising an oxygenation step, wherein said formed aqueous slurry is intimately contacted with an oxygen-containing gas for at

least one hour, and a chlorination step, wherein the oxygenated slurry is intimately contacted with a source of hypochlorite ions for at least one hour;

(c) simultaneously contacting the oxidized aqueous slurry, in a plurality of stages, with said cyanide complexing agent and granular activated carbon, the carbon flowing in countercurrent fashion with said slurry, wherein the temperatures of the slurry is maintained between about 40° and 100° F., whereby said gold values are transferred to said granular activated carbon; and

(d) separating said granular activated carbon from said aqueous slurry.

4,289,533

DEOXIDIZING ALLOY FOR MOLTEN STEEL

Koki Gunji, Tokyo, and Takehiro Dan, Funabashi, both of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Continuation of Ser. No. 937,122, Aug. 28, 1978, abandoned. This application Dec. 28, 1979, Ser. No. 108,060
Claims priority, application Japan, Mar. 2, 1978, 53/22851
Int. Cl.³ C22C *21/00*
U.S. Cl. 75—138 **1 Claim**

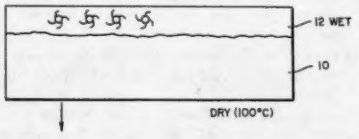
1. A deoxidizing alloy for molten steel consisting essentially of aluminum and from 2 to 10 mole %, based on the aluminum, of yttrium.

4,289,534

METAL POWDER PAINT COMPOSITION

Robert J. Deffeyes, Arlington, and Harris W. Armstrong, Fort Worth, both of Tex., assignors to Graham Magnetics, Inc., North Richland Hills, Tex.

Division of Ser. No. 793,384, May 3, 1977, Pat. No. 4,186,244. This application Jul. 30, 1979, Ser. No. 62,016
Int. Cl.³ C09D *5/24*
U.S. Cl. 106—1.14 **14 Claims**



1. In a paint composition comprising a liquid vehicle and a non-conductive metal powder composition, the improvement comprising said metal powder composition being formed of (a) a metal powder substrate and (b) organic groups chemically bonded to said metal powder substrate and forming a protective barrier between the metal particles, said metal powders being thermally convertable into fusible metal powder and subsequently into a conductive mass, upon the destruction of said protective barrier.

4,289,535

HEAT SENSITIVE COATING

Barry L. Marginean, Scottsville, and Warren A. Hookway, Jr., Pittsford, both of N.Y., assignors to Labelon Corporation, Canandaigua, N.Y.

Filed Mar. 14, 1980, Ser. No. 130,364
Int. Cl.³ C09D *11/00*
U.S. Cl. 106—19 **13 Claims**

1. A heat-sensitive coating composition for a thermo-responsive printing or recording record material for thermal printing devices which comprises:

a color-forming amount of a finely divided solid chromogenous basic 3,3-bisarylphthalane derivative, and

a color-developing amount of a finely divided solid phenol derivative which at thermal printing temperature is at least partially fluidizable and capable of a color-forming reaction with the chromogenous 3,3-bisarylphthalane derivative distributed in a carrier composition comprising a substantially water soluble anionic polysaccharide gum and a stability enhancing amount of sucrose benzoate.

4,289,536

GLASS FIBER REINFORCED CEMENTS AND PROCESS FOR MANUFACTURE OF SAME

Ernst Dereser, Goe, Belgium, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 953,142, Oct. 25, 1978, abandoned. This application Mar. 19, 1980, Ser. No. 131,348
Int. Cl.³ C04B *7/02*
U.S. Cl. 106—99 **26 Claims**

1. A fiber reinforced cementitious product comprising a cement as a continuous phase and fibers dispersed as reinforcement in the continuous phase, with said product including flocculating agent and a finely divided inorganic material having a surface area greater than 20 m^2/g present in (a) admixture with the cement, (b) as a size coating on the fibers or (c) both.

4,289,537

METHOD OF PRODUCING CEMENT

Howard F. Davis, Jr., Pittsburgh, and John A. Persson, Gibsonia, both of Pa., assignors to Lectromelt Corporation, Pittsburgh, Pa.

Filed Mar. 6, 1980, Ser. No. 127,556
Int. Cl.³ C04B *7/32*
U.S. Cl. 106—100 **8 Claims**

1. A method of producing Portland cement composition melts in an electric arc furnace including the steps of:

charging a mixture of first material containing calcium oxide and a second material containing silicon dioxide into an electric arc furnace having at least two carbon electrodes, energizing the electrodes to maintain a temperature in the furnace of about 3200° F., feeding said materials into the furnace at such a rate that the conductivity thereof remains about 175 mho per meter, and maintaining a ratio of the electrode voltage to current at a level that ensures that the electrode will remain in close proximity to, but out of contact with the molten furnace bath.

4,289,538

SEALING GLASS-CERAMIC ARTICLES

Francis L. Orso, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sep. 13, 1978, Ser. No. 942,072
Int. Cl.³ C09K *3/10*
U.S. Cl. 106—286.5 **5 Claims**

1. A sealing mixture for forming a seal between glass-ceramic materials, which seal is to be mechanically and dielectrically strong, hermetic and stable without foaming when reheated in vacuum to temperature of 900° C, and which mixture consists of a devitrifiable glass frit having a melting point greater than 930° C., antimony metal powder and sufficient vehicle to provide a sealing mixture with viscosity to effect coating of the materials,

the glass frit having a coefficient of thermal expansion sufficiently compatible with the materials being sealed and the antimony metal powder being combined with the frit in an effective amount such that, when reacted with the frit, they will yield a seal characterized by a coefficient of thermal expansion matching those of the materials being sealed and by stability without foaming when heated in a vacuum to a temperature of 900° C.

4,289,539

PHOSPHORUS-NITROGEN-OXYGEN COMPOSITION AND METHOD FOR MAKING SUCH COMPOSITION AND APPLICATIONS OF THE SAME

Pei-Ching Li, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 772,804, Feb. 28, 1977, Pat. No. 4,172,158.
This application May 25, 1979, Ser. No. 42,642
Int. Cl.³ H01B *3/00, 3//02*
U.S. Cl. 106—286.8 **6 Claims**

1. A coating composition comprising gaseous phosphorus-nitrogen-oxygen material having about 16 to 27 percent by weight of oxygen; the dielectric breakdown strength on bare silicon of the amorphous film resulting from the application of said coating composition being between about 10 to 20×10^6 volts/cm based on equivalent oxide thickness.

4,289,540

HYDROLYZED STARCH-CONTAINING COMPOSITIONS

Raymond N. Yong, and Amar J. Sethi, both of Beaconsfield, Canada, assignors to Suncor Inc., Toronto, Canada

Filed Aug. 17, 1978, Ser. No. 934,560
Claims priority, application Canada, Jan. 30, 1978, 295881; Aug. 2, 1978, 308619
Int. Cl.³ C13L *1/08*
U.S. Cl. 127—33 **8 Claims**

1. A composition comprising a hydrolyzed starch obtained by the aqueous hydrolysis of wheat starch in the presence of insoluble metal salts formed in situ and an additive comprising a lower aliphatic alcohol, acetone, yeast, or lactic acid.

4,289,541

PROCESS OF CLEANING AN AUSTENITIC STEEL SURFACE

Felix Wallner, and Walter Lugscheider, both of Linz, Austria, assignors to Vereinigte Oesterreichische Eisen-und Stahl-Werke Alpine Montan Akteingesellschaft, Vienna, Austria

Continuation of Ser. No. 816,864, Jul. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 692,531, Jun. 3, 1976, abandoned. This application Feb. 21, 1979, Ser. No. 13,735
Claims priority, application Austria, Sep. 25, 1975, 7356/75
Int. Cl.³ C23G *5/00*; B24C *1/00*
U.S. Cl. 134—7 **6 Claims**

1. A process of cleaning a surface of austenitic steel, which comprises the steps of

(a) blasting the surface with an abrasive mixture consisting, by volume, of 40% to 90% of corundum and 60% to 10% of a liquid, the corundum having an average grain size of 0.2 to 0.6 mm and corundum grains having triangular faces,

(1) the abrasive blasting mixture being accelerated and applied to the austenitic steel surface by a compressed gas under a pressure in the range of 2.5 to 5.5 atmospheres, the gas pressure increasing in direct proportion to the liquid content in the mixture, and

(2) 0.8 to 3 kg of corundum being applied per 100 cm^2 of the austenitic steel surface to be cleaned, and

(b) applying a rinsing liquid to the blasted surface before the surface has dried.

4,289,542

METHOD OF VAPOR DEGREASING

Ernest O. Roehl, Huntington Beach, Calif., assignor to Rho-Chem Corporation, Ingelwood, Calif.

Filed Jun. 30, 1980, Ser. No. 163,988
Int. Cl.³ B08B *7/00*
U.S. Cl. 134—11 **6 Claims**

1. In a method of vapor degreasing by contacting a contaminated article with vapors of a solvent consisting essentially of perchlorethylene, the improvement which comprises:

(a) adding a sufficient amount of trichlorethylene to the solvent to reduce the initial boiling point of the resultant solvent blend to about 240° F.; and

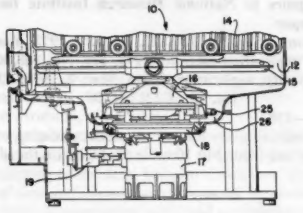
(b) conducting vapor degreasng operations with the solvent blend of step (a) at reflux temperatures and removing contaminants with said solvent until the temperature of the contaminated solvent blend reaches about 256° F.

4,289,543

METHOD FOR PRE-CONDITIONING A WAREWASHER

Ben J. Vallor, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Aug. 9, 1979, Ser. No. 65,305
Int. Cl.³ B08B *30/00*
U.S. Cl. 134—25.2 **2 Claims**



1. A method for preconditioning a warewasher of the type in which food ware items are placed in a wash chamber and water is periodically supplied from a water supply at a temperature below the effective warewashing temperature by recirculating the water collected in a lower portion of the chamber and spraying it under pressure onto the food ware items, and the water flows by gravity from the food ware items back to the lower portion, comprising the steps of:

(a) first introducing a predetermined quantity of water from the water supply into the wash chamber of the warewasher,

(b) next statically heating the water electrically in the lower portion of the wash chamber to a temperature in the range of 140° F. to 150° F.,

(c) then, after static heating is completed, without the use of warewashing chemicals, for the first time recirculating and spraying the heated water in the wash chamber onto the food ware items for a duration sufficient to remove food soil therefrom without causing substantial foaming or disintegration of the food soil in the wash chamber as it is recirculated, and to simultaneously warm the food ware and the wash chamber to a sufficient temperature such that supply water subsequently added will not be further reduced in temperature by the food ware items, and the subsequent addition of heat in an amount less than in the static heating step will be sufficient to maintain proper washing action during subsequent recirculation for effective soil removal during a subsequent washing operation,

(d) draining the water and removed food soil from the wash chamber after said recirculating and spraying,

(e) subsequently introducing water from the water supply into the wash chamber of the warewasher in a dynamic fill in which the water is simultaneously recirculated and sprayed onto the food ware items therein,

(f) adding warewashing chemicals to the subsequently added water in the wash chamber as it is recirculated and sprayed therein onto the preconditioned food ware items within the wash chamber of the warewasher, and

(g) simultaneously adding heat to the subsequently added water in the wash chamber at a rate sufficient to raise the water temperature to and maintain the water temperature at an effective warewashing temperature during washing, but at a rate lower than in the static heating step.

4,289,544

INHIBITION OF FRETTING CORROSION OF METALS

Geoffrey Dearnaley, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, England

Filed Oct. 11, 1979, Ser. No. 83,848

Claims priority, application United Kingdom, Oct. 16, 1978, 40669/78

Int. Cl.³ C23F 15/00; C22F 3/00

U.S. Cl. 148—4 8 Claims

1. A process for treating a bearing surface containing titanium to inhibit fretting corrosion and improve the fretting fatigue resistance thereof, comprising the operations of depositing under reduced pressure on the said bearing surface an active species having a higher heat of formation of its oxide than titanium, and heating the bearing surface to a temperature and for a period sufficient to cause the deposited active species to migrate into the bearing surface to provide a surface region thereof containing the active species.

4,289,545

PROCESS FOR THE BORONIZING OF PIECES MADE OF METAL OR CERMET

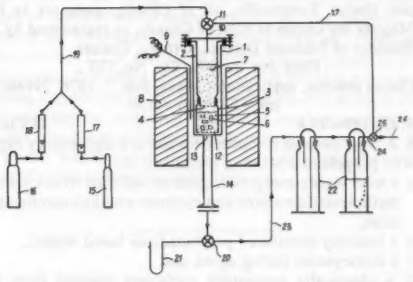
Francois H. J. Thevenot, Saint-Etienne; Patrice M. V. Goeuriot, Firminy; Julian H. Driver, Saint-Etienne, and Jean-Paul R. Lebrun, Bougival, all of France, assignors to Association pour la Recherche et le Developpement des Methodes et Processus Industriels (ARMINES), Paris, France

Filed Feb. 21, 1980, Ser. No. 123,425

Claims priority, application France, Feb. 27, 1979, 79 04991

Int. Cl.³ C23C 11/00

U.S. Cl. 148—6.3 15 Claims



1. Process for the treatment by boronising pieces of a material selected from the group consisting of alloys of Fe, Ni and Co and cermets, said process comprising heating said pieces to an operating temperature in the range of 850° to 1,150° C. while in the presence of a solid boronising agent, and activating the boronising by simultaneously subjecting the pieces to the contact action of a stream of a gaseous fluorine-containing agent containing trifluoroboroxole $(BOF)_3$, under predetermined pressure and temperature conditions.

4,289,546

AQUEOUS ACIDIC LUBRICANT COMPOSITION AND METHOD FOR COATING METALS

Kenneth J. Hacias, Sterling Heights, Mich., assignor to Hooker Chemicals & Plastics Corp., Madison Heights, Mich.

Continuation-in-part of Ser. No. 64,652, Aug. 7, 1979, abandoned. This application Jul. 24, 1980, Ser. No. 171,857

Int. Cl.³ C23F 7/10

U.S. Cl. 148—6.15 R 40 Claims

1. An aqueous acidic lubricant coating composition for treating metal surfaces prior to metal forming operations comprising an aqueous emulsion containing:

(a) from about 0.2% to about 15% by weight phosphate ions;

(b) from about 0.3% to about 16% of an emulsified organic lubricant selected from the group consisting of C_8 to C_{40} carboxylic acids and alcohols including the esters, mono and polyamide salts, mono and polyalkyl (C_1–C_{18}) amine salts thereof as well as mixtures thereof;

(c) from about 0.1% to about 10% of an emulsifying agent selected from the group consisting of N-tallow poly(-propyleneamine) having from 1 to 5 propyleneamine groups, oxazoline waxes and mixtures thereof;

(d) from about 0.1% to about 5% of a corrosion inhibitor comprising a salt of a C_7–C_{18} carboxylic acid and an aliphatic amine containing up to C_{12}; and

(e) water.

said composition having a pH above that at which excessive pickling of the metal surface occurs and below that at which insufficient reaction with the metal surface occurs to form a phosphate coating.

4,289,547

AQUEOUS ACIDIC LUBRICANT COATING COMPOSITION AND METHOD

Peter F. King, Farmington Hills, and George J. Beyer, Troy, both of Mich., assignors to Hooker Chemicals & Plastics Corp., Madison Heights, Mich.

Continuation-in-part of Ser. No. 64,682, Aug. 7, 1979, abandoned. This application Jul. 24, 1980, Ser. No. 171,859

Int. Cl.³ C23F 7/10

U.S. Cl. 148—6.15 R 21 Claims

1. An aqueous acidic lubricant coating composition for treating metal surfaces prior to metal forming operations comprising an aqueous emulsion comtaining:

(a) from about 0.2% to about 15% by weight phosphate ions;

(b) from about 0.3% to about 16% of an emulsified organic lubricant selected from the group consisting of C_8 to C_{40} carboxylic acids and alcohols including the esters, mono and polyamide salts, mono and polyalkyl (C_1–C_{18})amine salts thereof as well as mixtures thereof;

(c) from about 0.1% to about 10% of an emulsifying agent selected from the group consisting of N-tallow poly(-propyleneamine) having from 1 to 5 propyleneamine groups, oxazoline waxes and mixtures thereof;

(d) from about 0.25% to about 3% of a chelating agent comprising ethylenediaminetetraacetic acid or the partial or tetra alkali metal or ammonium salts thereof; and

(e) water;

said composition having a pH above that at which excessive pickling of the metal surface occurs and below that at which insufficient reaction with the metal surface occurs to form a phosphate coating.

4,289,548

HIGH STRENGTH COLD FINISHED BARS

John H. Bucher; John F. Butler, both of Bethel Park, and John F. Held, Verona, all of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1977, Ser. No. 826,014

Int. Cl.³ C21D 9/52

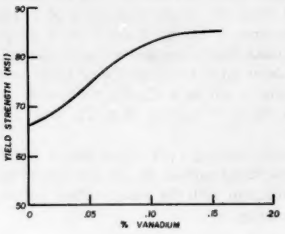
U.S. Cl. 148—12 B 11 Claims

1. A method for producing a high strength, cold finished steel bar, comprising:

a. hot rolling a killed steel consisting essentially of 0.30% to 0.65% carbon, 0.30% to 1.65% manganese, 0.05% maximum sulfur, 0.01% to 0.35% silicon, 0.01% maximum aluminum, 0.07% to 0.15% vanadium, 0.008% to 0.025% nitrogen, balance iron, to form a bar having a yield strength between about 70 and 100 k.s.i.; and

b. cold drawing said bar to effect from 4% to 25% reduction

in its area and thereby obtain a minimum yield strength 125 k.s.i., a minimum total elongation of 5%, a minimum



reduction in area of 15%, good toughness, and good abrasion resistance.

4,289,549

RESIN BONDED PERMANENT MAGNET COMPOSITION

Kazutomo Kasai, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 23, 1979, Ser. No. 87,602

Claims priority, application Japan, Oct. 31, 1978, 53/134323; Jul. 24, 1979, 54/94001

Int. Cl.³ G03G *9/14;* H01F *1/00, 1/117*

U.S. Cl. 148—101 **9 Claims**

1. A resin-bonded permanent magnet composition comprising a permanent magnet composition of a single phase rare-earth $R_2(Co\ Cu\ Fe\ M)_{17}$ alloy, wherein: the rare earth element is present in the alloy in an amount about equal to or greater than 22.0 and less than 24.0 weight percent; copper is present in the alloy in an amount about equal to or greater than 2.5 and equal to or less than 13.0 weight percent, iron is present in an amount at least 15.0 and less than or equal to 39.0 weight percent; M is at least one element selected from the group consisting of manganese, silcon, titanium, niobium, zirconium, hafnium, tantalum, chromium, vanadium, molybdemium and aluminum and is present in the alloy in an amount about equal to or greater than 0.3 and less than or equal to 4.0 weight percent; the balance of the alloy being cobalt and including at least about 10 volume percent of a combining agent admixed with said composition, based on the total volume of the composition and combining agent.

4,289,550

METHOD OF FORMING CLOSELY SPACED DEVICE REGIONS UTILIZING SELECTIVE ETCHING AND DIFFUSION

Wolfgang M. Feist, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 25, 1979, Ser. No. 42,686

Int. Cl.³ H01L *21/20, 21/302*

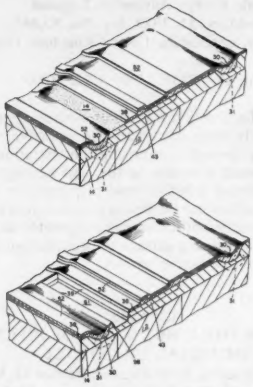
U.S. Cl. 148—175 **26 Claims**

1. A method for forming a semiconductor structure comprising the steps of:

(a) forming an isolation region having an insulating material in a portion of a semiconductor layer;

(b) forming a doped region in the semiconductor layer contiguous to the isolation region;

(c) bringing an etchant into contact with a surface portion of the doped region and a contiguous surface portion of the isolation region; and



(d) selectively etching the doped region forming a depression having wall portions separated from the isolation region by portions of the doped region.

4,289,551

HIGH-ENERGY EXPLOSIVE OR PROPELLANT COMPOSITION

Guy Perrault; Roger Lavertu, both of Ste-Foy, and Jean-Francois Drolet, Loretteville, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jan. 2, 1979, Ser. No. 773

Claims priority, application Canada, Feb. 7, 1978, 296408

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.4 **24 Claims**

1. A pour-castable composite for use as a high-energy explosive or propellant consisting essentially of:

a. a solid highly-energetic ingredient selected from cyclotrimethylenetrinitramine and cyclotetramethylenetetranitramine,

b. a hydroxy-terminated polybutadiene based binder,

c. a diisocyanate curing agent, and

d. a chemically compatible surfactant selected from the group consisting of:

(1) compounds of the formula:

$$HO(CH_2)_x-\overset{\overset{O}{\|}}{C}-N-(R)_2$$

where R is $C_xH_{(2x+1)}$, and where each x is independently an integer from 1 to 6;

and mixtures of (1) and N,N-di-(2-hydroxyethyl)-4,4-dimethylhydantoin.

4,289,552

METHOD FOR THE CONTINUOUS WELDING OF THERMOPLASTIC SHEETS

Heiner I. Hammer, Rosengarten, Fed. Rep. of Germany, assignor to GFA-Gesellschaft für Flächenabdichtung mit beschränkter Haftung, Garstedt, Fed. Rep. of Germany

Filed Jul. 21, 1978, Ser. No. 926,615

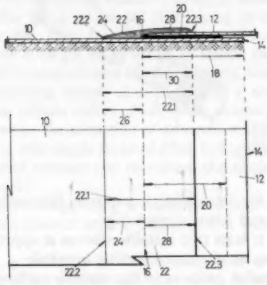
Claims priority, application South Africa, Jul. 22, 1977, 77/4427

Int. Cl.³ B32B *31/16, 31/30*

U.S. Cl. 156—73.4 **18 Claims**

1. A welding method comprising the steps of providing a pair of thermoplastic sheets each including opposite surfaces

bridged by a terminal edge defining an edge portion, placing the edge portion of a first overlapping of the pair of sheets into overlapping relationship with the edge portion of a second overlapped of the pair of sheets and with the terminal edges thereof spaced a predetermined distance from each other and in generally parallel relationship to each other, applying a continuous linear strip of plastic welding material in thermoplastic state progressively and in generally parallel relationship to said terminal edges along a first of the opposite surfaces of the overlapping edge portion and a first of the opposite surfaces of the overlapped edge portion adjacent to the terminal



edge of the overlapping edge portion and in bridging relationship thereto and with the terminal edge of the overlapping edge portion and being disposed between opposite terminal edges of the continuous linear strip of welding material, performing the overlapping of the overlapping and overlapped edge portions in the absence of overlapping any portion of the overlapping first sheet upon itself and in the absence of overlapping any portion of the overlapped second sheet upon itself, and securing the second surfaces of the overlapping and overlapped edge portions to each other prior to applying the strip of plastic welding material by sandwiching therebetween a strip of pressure sensitive adhesive.

4,289,553

HEAT-SHRINKABLE ARTICLE

Jean-Marie E. Nolf, Beauvechain, Belgium, assignor to N.V. Raychem S.A., Kessel-lo, Belgium

Filed Oct. 30, 1978, Ser. No. 955,537

Claims priority, application United Kingdom, Nov. 8, 1977, 46516/77

Int. Cl.[3] **B29C** *27/00;* **B32B** *31/00;* **H01R** *4/00;* **H02G** *13/06*

U.S. Cl. 156—86 **32 Claims**

1. A heat-recoverable article which comprises a heat-shrinkable sleeve having bonded thereto by a layer of hot-melt adhesive a smooth inner lining of a continuous metal foil, the thickness of the foil being selected so that the foil has a visually even surface configuration upon heat shrinkage of the sleeve and which comprises internal reinforcing means comprising at least one longitudinally compressible coil disposed longitudinally within the sleeve.

4,289,554

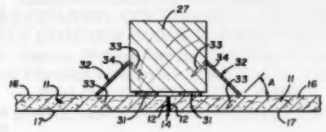
METHOD FOR MAKING A MOBILE HOME CEILING CONSTRUCTION

James E. Reicherts, Oakwood Hills, and William C. Veschuroff, Palatine, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 8,919, Feb. 5, 1979. This application May 12, 1980, Ser. No. 148,891

Int. Cl.[3] **B32B** *31/16;* **B27F** *7/00;* **B32B** *7/08;* **E04B** *5/57*

U.S. Cl. 156—92 **28 Claims**



1. A method of manufacturing a unitized ready-to-install mobile home ceiling structure comprising the steps of:

(A) placing a plurality of generally rectangular panels on a tunnel jig with the longer sides of the panels generally perpendicular to the longitudinal axis of the tunnel jig abutting longer sides of said panels at joints in edge-to-edge adjacent relationship forming an overall generally rectangular panel arrangement having front and back face surfaces;

(B) positioning a roof frame on the panel arrangement contacting the back face surfaces along bottom chords of truss members and along side edge rails whereby the side edge rails and outer truss members reside along the perimeter of the generally rectangular panel arrangement at the back face surface thereof;

(C) back fastening bottom chords of truss members intermediate the outer truss members to the back face of the panels by means of driving fasteners along the bottom chords at the back face surface of the panels and by means of depositing adhesive material between the bottom chords and the back face surface of the panels;

(D) front fastening the panels along substantially the full perimeter of the rectangular panel arrangement by means of driving fasteners upwardly at the front face surface of the panels along said perimeter thereof wherein said fasteners extending through the panels and penetrating the side edge rails and penetrating bottom chords of the outer truss members;

(E) transporting the roof frame and panel arrangement from the tunnel jig as a unit providing a ready-to-install unitized mobile home ceiling structure wherein the set-up time of the adhesive material does not restrict moving the unit.

4,289,555

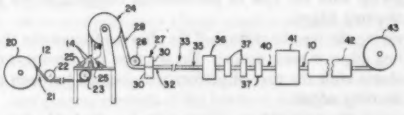
METHOD OF MAKING POLYMERIC HOSE

Doyle V. Haren, Clyde, and William M. Edwards, Waynesville, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 956,762, Nov. 1, 1978, Pat. No. 4,212,327. This application Mar. 3, 1980, Ser. No. 126,266

Int. Cl.[3] **B29D** *23/12*

U.S. Cl. 156—149 **6 Claims**



1. In a method of making a polymeric hose comprising the steps of, providing a polymeric inner base tube, braiding a reinforcing braid made of aramid yarn concentrically around

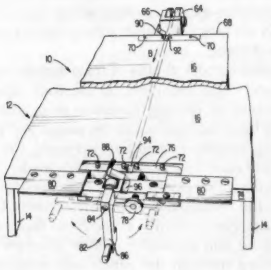
and against said base tube, said aramid yarn having great affinity for water, providing a layer of plastisol adhesive around said braid, flame curing said adhesive layer, and disposing a cover tube concentrically around said reinforcing braid and adhesive layer, the improvement comprising the steps of, applying a moisture impervious tubular film against said braid, and drying said film, said applying and drying steps being achieved following said braiding step and prior to said adhesive providing step, said film isolating said aramid yarn and resulting in a tubular zone between said cover tube and braid free of water moisture created bubbles.

4,289,556

METHOD AND APPARATUS FOR SPLICING FOLDED PAPER

Barclay Booth, Potomac, Md., assignor to Paper, Inc., Gaithersburg, Md.

Filed Aug. 6, 1979, Ser. No. 63,697
Int. Cl.³ B65H *19/00*
U.S. Cl. 156—157 **9 Claims**



1. A method of joining together a plurality of sections of fan-folded interconnected single sheets to form a composite stack comprising:

positioning a trailing transverse edge of the last sheet of a first section of fan-folded interconnected single sheets in a predetermined position on a support surface;

positioning a leading transverse edge of the first sheet of a second section of fan-folded interconnected single sheets on the support surface in edge-to-edge abutting relation with the trailing transverse edge of the last sheet of the first section;

removing splicing tape from a tape reel and forming a row of longitudinally-extending perforations in the center of the tape as the tape is being removed;

centering the removed tape above the abutting edges of the sheets with the row of perforations centered above the abutting edges;

applying the tape to regions of the sheets adjacent the abutting edges in such manner that the tape interconnects the sheets with the row of perforations located between the abutting edges;

severing the applied tape adjacent the longitudinal edges of the interconnected sheets; and

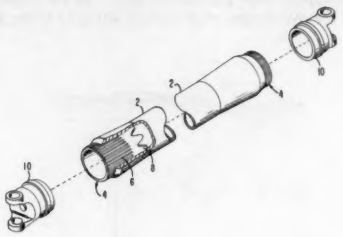
positioning the second section on top of the first section to form a composite stack.

4,289,557

METHOD FOR MASS PRODUCING COMPOSITE SHAFTS

Jay W. Stanwood, Long Beach; William A. Clarke, Irvine, and Johannes MacLeane, Chino, all of Calif., assignors to Ford Aerospace & Communications Corp., Detroit, Mich.

Filed Aug. 6, 1979, Ser. No. 64,299
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—171 **6 Claims**



1. Method for fabricating composite fiber-adhesive shafts with metallic and joints comprising:

positioning at least two metallic sleeves at appropriate locations along an elongated tooling mandrel;

forming parallel grooves in the outside surface of each of said sleeves;

winding a first layer of fibers around said mandrel-cum-sleeves;

winding at least a second layer of fibers on top of said first layer;

curing said composite; and

removing the mandrel from within the cured composite shaft structure;

wherein said sleeves form at least part of said end joints;

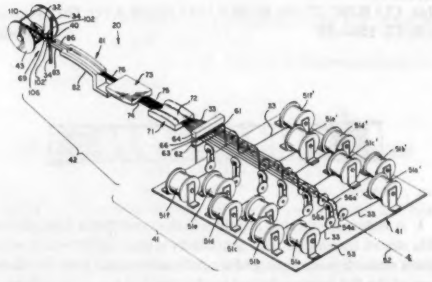
wherein one end of each sleeve is tapered and cut to form a plurality of crimping members having substantially identical shapes.

4,289,558

METHODS OF AND APPARATUS FOR ORGANIZING FIBER LIGHTGUIDES INTO A PLANAR ARRAY

Bernard R. Eichenbaum, and Francis J. Topolski, both of Lilburn, Ga., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Murray Hill, N.J.

Filed Jun. 30, 1978, Ser. No. 921,625
Int. Cl.³ B32B *5/00*
U.S. Cl. 156—179 **10 Claims**



1. Apparatus for organizing a plurality of fiber lightguides in a reproducible manner into a planar array, which comprises:

means for advancing including payout means a plurality of fiber lightguides along separate, adjacent paths with the

advance along at least portions of the paths being in the same direction and with their longitudinal axes generally in a single plane;

means for taking up the plurality of fiber lightguides; and

means interposed between the payout means and the taking up means for converging the fiber lightguides that are being advanced and for organizing them continguously into a planar array having a predetermined lateral ordering, said converging and organizing means including a first surface having a length which extends along said paths of travel and which has a curvature that is convex in the direction of advance and a curvature that is concave in another direction transverse to the direction of advance, said first surface being effective to apply forces to the fiber lightguides being advanced therealong to converge and organize the fiber lightguides into contiguous parallel relation in a single layer array in which the lightguides have said predetermined lateral ordering, said converging and organizing means also including a second surface having an infinite radius of curvature at least in a direction transverse to the direction of advance and being adapted to receive said single layer of fiber lightguides in contiguous parallel relation and to reform the single layer into a planar array.

9. A method of organizing a plurality of fiber lightguides in a reproducible manner into a planar array, which comprises the steps of:

advancing a plurality of fiber lightguides along separate, adjacent paths with the advance along at least portions of the paths being in the same direction and with their longitudinal axes generally in a single plane;

causing the fiber lightguides that are being advanced to be arrayed into a single layer in which they are arrayed contiguously in the predetermined lateral ordering by guiding the fiber lightguides into engagement with and along a first surface having a length which extends along said paths, which is generally convex in the direction of advance, and which is generally concave in another direction transverse to the direction of advance; and

causing the single layer contiguous array of fiber lightguides to be guided into engagement with and past a second surface having an infinite radius of curvature at least in a direction transverse to their direction of advance to reform the single layer of contiguous fiber lightguides into a planar array of contiguous fiber lightguides.

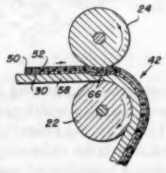
4,289,559
PROCESS AND APPARATUS FOR HEAT LAMINATING FILM TO A SUBSTRATE

Shirley D. Murphy, Rte. 6, Box 336A, New Bern, N.C. 28560

Filed Oct. 18, 1979, Ser. No. 85,878

Int. Cl.³ B44C *1/16*

U.S. Cl. 156—238 **20 Claims**



1. A process for laminating a heat sensitive film to a substrate comprising the steps of

(a) positioning the heat sensitive film on the upper surface of the substrate

(b) placing the lower surface of the substrate on a hard, smooth, flexible supporting surface

(c) applying heat and pressure to the heat sensitive film and substrate to a degree that a laminating groove is formed in the hard, smooth, flexible supporting surface, for receiving the film and substrate, in which groove the film and substrate are laminated together

(d) removing the heat and pressure while maintaining the laminated material in engagement with the supporting surface until the heat is partially dissipated therefrom, and

(e) disengaging the laminated material from the supporting surface.

4,289,560
METHOD OF MAKING LAMINATES OF THERMOPLASTIC POLYMERS BY A SINGLE-CHANNEL COEXTRUSION PROCESS AND MELT INJECTOR BLOCK FOR USE THEREIN

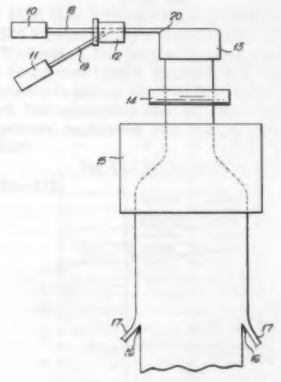
Phillip R. Simons, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 22, 1979, Ser. No. 87,072

Claims priority, application United Kingdom, Oct. 23, 1978, 41619/78

Int. Cl.³ B29D *9/00*

U.S. Cl. 156—244.18 **7 Claims**



1. A melt injector block for use in a single channel coextrusion process which comprises a primary channel for a primary stream of molten thermoplastic polymer, one or more secondary channels for one or more secondary streams of molten thermoplastic polymer, and a unified channel for a composite stream, characterised in that at the or each confluence where a secondary channel enters the primary channel the melt injector block also contains guides which commence in the primary channel and continue past the confluence into the unified channel and the primary channel enters the secondary channel between the guides.

4,289,561
METHOD FOR PREPARING A PLURALITY OF LABELS

Walter Holzknecht, Konrad Adenauerstrasse 6, D-808 Fürstenfeldbruck, Fed. Rep. of Germany

Filed Sep. 19, 1979, Ser. No. 78,588

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841515

Int. Cl.³ B32B *31/00*; A44C *3/00*; B26D *7/06*; B65H *39/02*

U.S. Cl. 156—265 **12 Claims**

1. Method of preparing a large number of labels using a base sheet having a front and rear face, the method comprising the steps of:

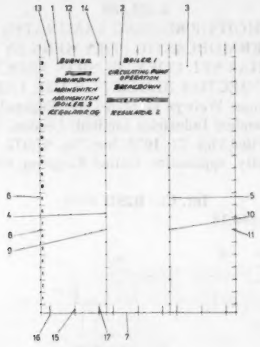
(1) placing markings on said front face for rows and columns and placing symbols of the labels on said front face of said base sheet arranged in said rows and columns;

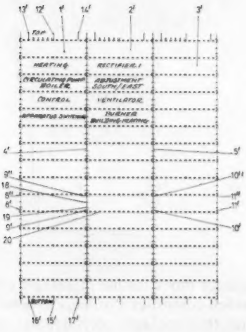
(2) forming a composite sheet by cementing at least one reinforcement sheet onto said base sheet;

(3) cutting said composite sheet along a first outer edge

parallel to said rows and along a second side edge perpendicular to said first outer edge;

(4) laying said composite sheet with one of said first and second edges against a bearing surface and cutting said composite sheet through both said base sheet and said at least one reinforcement sheet in a first direction perpendicular to said one of said first and second edges along said markings into disconnected strips;





(5) connecting said strips in their original alignment by applying a carrier material to said strips; and

(6) laying said connected strips with the remaining edge against a bearing surface and cutting said strips along said markings in a second direction perpendicular to said first direction.

4,289,562

CASE LABELER

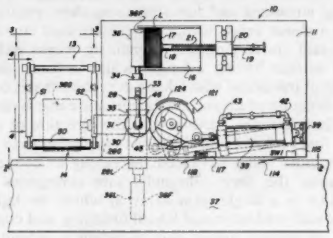
Sherril H. Chisolm, 5919 Southwest Ave., St. Louis, Mo. 63139

Filed Jul. 2, 1980, Ser. No. 165,931

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—364 **7 Claims**

1. A case labeler for presenting an adhesive label in the path of movement of a case requiring a label, said labeler comprising: a frame adjacent the path of movement of cases; a label supporting head; a magazine for supporting a supply of labels; adhesive supply means having an applicator member for transferring adhesive from said supply to the labels; operating means connected to said head for moving said head in a path from said magazine and past said applicator member into a position in the path of movement of a case; vacuum generating means connected to said head for permitting said head to engage and pull a label out of said magazine and retain label engagement past said adhesive applicator member and into a position in the path of a case; and control means operatively connected to said operating means and said vacuum generating means and including first means responsive to the approach of a case for energizing said operating means to effect movement of said head between said magazine and a position in the path of case movement, and second means responsive to the advance of a case to the position of said head in the case path for ending the generation of vacuum so the label is released to the case and adhesively secured thereto and causing said operating means to return said head to said magazine.



4,289,563

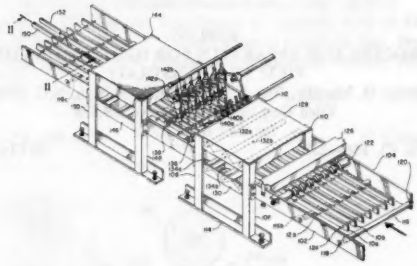
GRATING CONSTRUCTION AND ASSEMBLY METHOD AND APPARATUS

Joseph W. Wiechowski, 420 Avenida Salvador, San Clemente, Calif. 92672; Delmar S. Miller, 918 W. Balboa Blvd., Newport Beach, Calif. 92661, and Richard C. Kostner, 2060 Agate St., Orange, Calif. 92667

Division of Ser. No. 863,766, Dec. 23, 1977, Pat. No. 4,244,768. This application Apr. 21, 1980, Ser. No. 142,335

Int. Cl.³ E04C *2/22, 2/42*

U.S. Cl. 156—423 **2 Claims**



1. Apparatus for manufacturing grating from elongate polymer bonded fiber beams having a width greater than thickness and dowel rods, the beams having holes through the thickness spaced so as to permit said holes to be aligned, comprising:

means for supporting a plurality of said beams in spaced relationship with the widths in substantially parallel vertical planes, the dowel rods extending through aligned holes in said beams to form a loosely assembled grating;

a heating zone for heating the beams and dowel rods;

a gluing zone including means for applying a predetermined amount of glue to each beam-dowel rod intersection; and

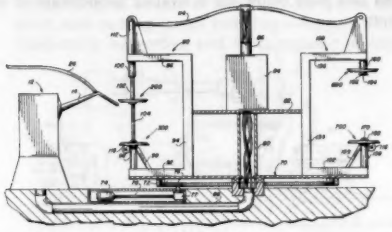
means for moving a lossely assembled grating in stepwise fashion for positioning each intersection of beam and dowel rod in the heating zone and in the gluing zone.

4,289,564

STRANDING APPARATUS

Donald E. Hanaford, Mesa, and Dale R. Oldham, Phoenix, both of Ariz., assignors to Arthur E. Thomson, Laveen, Ariz.

Filed Apr. 25, 1980, Ser. No. 143,711
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—425 **15 Claims**



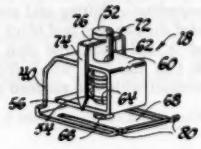
1. Stranding apparatus comprising, in combination:
frame means, including a first support element and a second support element;
first plate means rotatably secured to the first support element;
second plate means rotatably secured to the second support element and spaced apart from the first plate means;
a shaft secured to the frame means for locking together the first plate means and the second plate means for joint rotary movement relative to the first and second support element, and movable vertically for unlocking the first plate means and the second plate means; and
pin means secured to the first and second plate means and movable between an outer position to receive strands and a retracted position for removal of the strands.

4,289,565

APPARATUS FOR PUNCHING HOLES IN PAPER-LIKE SHEETS AND FOR SIMULTANEOUSLY PROVIDING REINFORCING MEMBERS THEREFOR

Harold B. Wilkins, 11171 Dorchester, Apt. 122, Southgate, Mich. 48195

Filed Mar. 31, 1980, Ser. No. 135,394
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—514 **10 Claims**



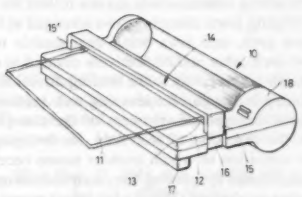
1. In combination with a punch for punching holes in paper-like sheets and having at least one cylindrical punching element movably mounted on a support member of the punch, the punch including a base member having an aperture aligned with the punching element and adapted to receive a punching end of the punching element at a top support surface of the base member, the punching element moving through a punching stroke between a retracted sheet-receiving position and an extended hole-punching position, the punching element extending into the aperture of the base member so that the punching element punches a hole through a sheet inserted between the base member and the punching element, the improvement comprising:
at least one cutting member operatively associated with said punch to move during the punching stroke of the punching element, the cutting member having at least one cutting blade extending below the top support surface of the base member in the hole punching position of the punching element to cut through an inserted sheet and an overlapping perforated tape disposed between the base member and the inserted sheet between the perforations in the tape so that a piece of the tape is separated from the remainder of the tape by the cutting action of the cutting blade and so that a substantially identical second hole is punched through the separated piece of tape by the punching element, wherein the separated piece of tape defines a reinforcing member for reinforcing the area adjacent to and defining the punched hole in the sheet.

4,289,566

DEVICE FOR HEAT-SEALING AND/OR CUTTING OF THIN FOILS OF SYNTHETIC MATERIALS

Roif Feil, Wasserburg, Fed. Rep. of Germany, assignor to Bosch Siemens Hausgerate GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 40,439, May 18, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 178,748
Claims priority, application Fed. Rep. of Germany, May 20, 1978, 7815239
Int. Cl.³ B29C *27/06*
U.S. Cl. 156—515 **4 Claims**



1. Device for heat-sealing or cutting thin foil of synthetic material between two dies which are linked to each other and can be pressed together against a restoring force comprising:
(a) a table-like support having a recess in the underside of said support parallel to the front edge of the support,
(b) a spring disposed in said recess,
(c) a base strip movable in and out of said recess, said strip movable into said recess upon the application of pressure to press said two dies together, and said strip movable out of said recess upon the release of said pressure by said spring as said restoring force,
(d) said table-like support having a pivotable edge on the underside of said support parallel to and to the rear of said base strip to permit said support to pivot on said edge when said base strip is moved into said recess,
(e) one die fixed to the top surface of said table-like support,
(f) another die disposed above said fixed die movable to press against said fixed die, said movable die having the form of a U-shaped yoke with the legs of the yoke fixedly attached to the yoke and movable therewith,
(g) transmission members comprising two-armed levers which are hinged at one end at the sides of the base strip and at the legs of the U-shaped yoke at the other end, and the levers at an intermediate point between the points of hinging are pivotally fixed to said support, whereby pressing down on the front of said support causes the base strip to move into the recess making the two-armed levers pivot around said intermediate point thereby effecting lowering of the yoke.

4,289,567

APPARATUS FOR APPLYING WEB SECTIONS TO A FLAT-LYING WORKPIECE

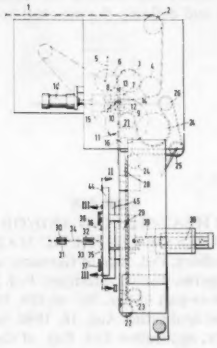
Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,914

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832391

Int. Cl.[3] **B32B** *31/18, 31/20, 35/00*

U.S. Cl. 156—517 **7 Claims**



1. Apparatus for applying a section severed from a web withdrawn from a supply reel onto a base of a flat-lying workpiece, comprising intermittently driven rollers for feeding the web to clamping jaws, clamping jaws arranged at both sides of a web feed path, said jaws being displaceable towards and away from each other and respectively divided to define a gap which extends transversely to the feeding direction of the web, a knife guided in the gap for severing web sections, and conveyor means disposed downstream of the clamping jaws, as viewed in the direction of web feed, for bringing a severed section to a position in which transfer means receive the section, transfer means for placing a severed section on a base (**35**) of a flat-lying workpiece (**34**), the conveyor means comprising a suction belt conveyor means (**11**) with a plurality of spaced parallel suction belts (**17** to **20**), and the transfer means comprising a punch (**39**) carrying at is front suction bars (**40** to **44**) which are parallel to the suction belts (**17** to **20**), means for holding the base (**35**) spaced from the suction belt conveyor means (**11**) in a plane parallel to a conveying plane of the suction belt conveyor means (**11**), and the suction bars (**40** to **44**) being movable towards the base (**35**) at right-angles to the conveying plane of the suction belt conveyor means (**11**) in gaps between the suction belts (**17** to **20**) beyond the conveying plane and retracted behind same.

4,289,568

APPARATUS FOR AUTOMATED APPLICATION OF HEAT SENSITIVE TAPE

Alex Trotsky, Anaheim, and Alan Brimmer, La Crescenta, both of Calif., assignors to Arnold Engineering Company, Marengo, Ill.

Filed Jun. 4, 1979, Ser. No. 44,883

Int. Cl.[3] **B32B** *31/00;* **B23P** *13/00*

U.S. Cl. 156—518 **6 Claims**

1. Apparatus for forming and applying a particularly shaped blank of heat sensitive tape to a metal strip, said apparatus including:

a frame;

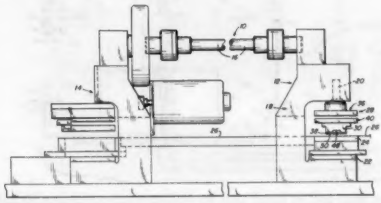
a stationary guide block mounted on said frame and having a track formed therein for supporting said strip;

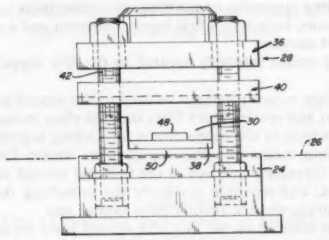
a drop-through blanking die assembly having a die, a mating punch, and a cooperable stripper plate;

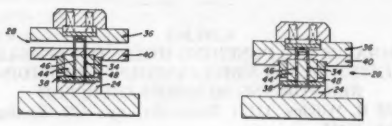
a tape carrier on said assembly for supporting a length of said tape in overlying relation to said die whereby said tape blank is formed upon closure of the die assembly;

means mounting said die assembly for integral reciprocal movement to and from said strip-supporting guide block whereby an air gap is established between the block and assembly during movement of the latter;

cooling means for maintaining the temperature of said die and said plate below the activating temperature of said tape;







said block being provided with heater means for maintaining the temperature of said strip above said activating temperature;

ram means for sequentially shifting said assembly to a position wherein said die engages said block and overlies the strip supported in said track, and then closing said die assembly such that the tape blank formed thereby is brought into contact with, and retained upon, the heated strip.

4,289,569

MANUFACTURE OF SEALED-END TUBULAR THERMOPLASTIC NET BAGGING

Kenneth H. Rabeneck, 3714 Stratford La., Louisville, Ky. 40207; Jerry R. Kantlehner, Rte. 1, Box 327A, and David E. Gallaher, 30001 Tattersall La., both of Prospect, Ky. 40059

Division of Ser. No. 945,020, Sep. 22, 1978, Pat. No. 4,190,690. This application Sep. 27, 1979, Ser. No. 79,526

Int. Cl.[3] **B65B** *7/06, 7/12, 51/22*

U.S. Cl. 156—580.2 **11 Claims**

1. Apparatus for manufacturing sealed end tubular thermoplastic net bagging from a continuous rope-like feedstock of tubular thermoplastic net bagging material, comprising:

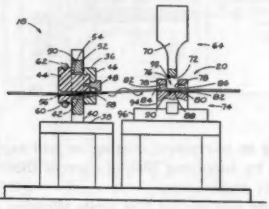
(a) a twisting station;

(b) a sealing station in the vicinity of said twisting station;

(c) means for intermittently axially advancing said feedstock through said twisting station and said sealing station, then pausing;

(d) the twisting station including means for gripping and angularly twisting said feedstock at said twisting station, sufficiently to substantially fully radially condense said feedstock in the vicinity of said twisting station;

(e) the sealing station including melting means for melting an axially short segment of said radially condensed feedstock into a single, massive integral seal nugget incorporating substantially all strands of said feedstock within said segment, said melting means including a support fixture for temporarily supporting said short segment of feedstock



during said melting, said support fixture comprising a bar having a slot formed externally therein, part way through the depth and thickness thereof so as to create two outstanding flanges respectively upstream and downstream of said slot, and means providing coaxial openings through both flanges, which openings are disposed to have said feedstock threaded therethrough, so that said segment thereof lies between said flanges; thereby producing a converted feedstock of tubular thermoplastic net bagging having a respective said seal nugget incorporated therein every so often.

4,289,570

SEED AND METHOD FOR EPITAXIAL SOLIDIFICATION

Bruce E. Terkelsen, Cheshire, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1978, Ser. No. 969,129
Int. Cl.³ C30B *21/02, 17/00*
U.S. Cl. 164—122.1 **5 Claims**

1. The method of directionally solidifying a metal melt into an article with controlled crystallographic orientation using a seed and epitaxial growth, comprising the steps of:

(a) altering the composition of at least a portion of the seed using an element which lowers the melting point and which promotes dissolution in the melt of undesirable surface compounds, where the seed is adapted to contact the melt;

(b) providing a mold to contain the seed and to receive the melt;

(c) pouring molten metal into the mold to contact the seed and thereby melt the surface portion of the seed where its composition is altered; and

(d) directionally solidifying the melt to promote epitaxial growth from the seed.

4,289,571

METHOD AND APPARATUS FOR PRODUCING CRYSTALLINE RIBBONS

David N. Jewett, Harvard, Mass., assignor to Energy Materials Corporation, Ayer, Mass.

Filed Jun. 25, 1979, Ser. No. 51,998
Int. Cl.³ C30B *15/06, 35/00*
U.S. Cl. 156—617 H **8 Claims**

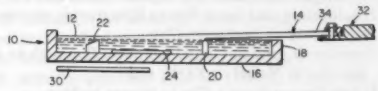
1. The method of forming a crystalline ribbon from a melt, comprising the steps of

(a) heating a melt in a crucible having a rim thereabout,

(b) placing on the surface of said melt a crystalline seed having a free edge and a distal pulling edge,

(c) controlling the temperature of said melt to allow solidification of said melt at said free edge of said seed to form a ribbon in one longitudinal rearward direction while withdrawing in a substantially opposite longitudinal forward direction said seed from said melt at a low positive acute angle with respect to the melt surface at a speed commensurate with the longitudinal growth of said ribbon,

(d) providing a separate site of attachment inwardly of the



rim of said crucible for a meniscus formed by the melt from the lower face of said ribbon as it leaves the surface of said melt to reduce spillage and freezing thereof,

(e) passively adjusting the growth rate of said ribbon to the changes in the speed of movement of said ribbon by drawing the growing end of said ribbon from the surface of said melt above a sub-surface stabilizer having an uppermost forward portion disposed closer to the melt surface than the lowermost rearward portion thereof, and,

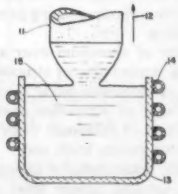
(f) thermally isolating the crystal growing portion of said melt from the remaining portion thereof.

4,289,572

METHOD OF CLOSING SILICON TUBULAR BODIES

David H. Sawyer, Lee Township, Midland County; Joseph A. Henige, Chesaning, and Alvin W. Rauchholz, Hemlock, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 27, 1976, Ser. No. 754,481
Int. Cl.³ C30B *29/00*
U.S. Cl. 156—617 SP **5 Claims**



1. A method for modifying the shape of the end of a silicon tubular body which comprises:

(a) immersing the end of the tubular body into a silicon melt;

(b) maintaining the melt at the melting temperature of silicon until a melt meniscus forms on the body above the melt surface, indicating the body has reached its melting temperature;

(c) withdrawing the tubular body gradually from the melt while controlling the temperature to cause progressive freezing of the melt meniscus to the end of the tubular body as the tubular body is withdrawn;

(d) adjusting the temperature and withdrawal rate to cause progressive diameter reduction of the frozen portion until the immersed end of the body is reduced to the desired extent; and

(e) thereafter increasing the withdrawal rate to separate the body from the melt.

4,289,573

PROCESS FOR FORMING MICROCIRCUITS

James Economy, San Jose; James R. Lyerla, Menlo Park, and Lester A. Pederson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 25,292, Mar. 30, 1979, abandoned. This application Mar. 3, 1980, Ser. No. 126,913
Int. Cl.[3] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 4 Claims

1. The process for forming a microcircuit comprising the steps of:

(1) forming on a substrate a resist film of resin containing hydrogen replaceable by reaction with NaOH or KOH;

(2) subjecting said resist film to lithographic processing;

(3) cross-linking said resist film;

(4) contacting the surface of said resist film with an aqueous solution of NaOH or KOH; and

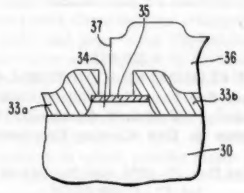
(5) exposing said resist film to plasma etching.

4,289,574

PROCESS FOR PATTERNING METAL CONNECTIONS ON A SEMICONDUCTOR STRUCTURE BY USING AN ALUMINUM OXIDE ETCH RESISTANT LAYER

Steven J. Radigan, and Robert L. Berry, both of San Jose, Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Continuation of Ser. No. 34,782, Apr. 30, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 157,996
Int. Cl.[3] H01L *21/28;* C23F *1/02*
U.S. Cl. 156—643 7 Claims



1. A process for protecting selected portions of a semiconductor structure from a plasma etching process, the process for protecting comprising:

depositing a layer of aluminum over at least the selected portions of the semiconductor structure;

forming a layer of aluminum oxide over at least those portions of the layer of aluminum overlying the selected portions, the layer of aluminum oxide being plasma etchable at a selected power level; and

plasma etching the semiconductor structure at a power level less than the selected power level to thereby remove material from the semiconductor structure except where the layer of aluminum oxide protects the underlying semiconductor structure by substantially stopping the plasma etching process.

4,289,575

METHOD OF MAKING PRINTED WIRINGBOARDS

Masashige Matsumoto; Hideaki Kou[illegible] Seiji Hiraide, and Kouichi Kawai, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

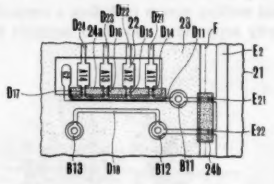
Filed Oct. 24, 1979, Ser. No. 87,713
Claims priority, application Japan, Oct. 30, 1978, 53-133423
Int. Cl.[3] H05K *3/06, 3/26*
U.S. Cl. 156—656 7 Claims

1. A method of making a printed wiring board, comprising the steps of:

preparing an insulating substrate by etching a conductive base pattern thereon, said base pattern consisting of circuit area and electroplating current supply area for electroplating the contact region of said circuit area;

covering a first plating and etching resistant insulating film on said base pattern except for said contact region and said supply area;

covering a second plating resistant film on said supply area;



forming an overplated coating on said exposed contact region by supplying plating current thereto through said supply area;

removing said second film while allowing said first film to remain intact; and

selectively etching off only exposed portions of said conductive base pattern in said supply area.

4,289,576

METHOD FOR REMOVING COBALT-CONTAINING DEPOSITS FROM SURFACES

John M. Wilson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 27, 1980, Ser. No. 153,668
Int. Cl.[3] C23F *1/00*
U.S. Cl. 156—667 25 Claims

1. A method of removing cobalt-containing deposits from surfaces comprising the step of contacting said deposits with a deposit removing composition for a period of time sufficient for said deposits to be dissolved therein, said composition being comprised of an aqueous acidic solution of a water soluble acid and a water soluble salt, the anionic portion of said salt being selected from the group consisting of cyano, thiocyanato, ferricyano, cyanato and mixtures thereof.

4,289,577

APPARATUS FOR CONCENTRATING POLYVINYL ALCOHOL SOLUTION

Katsuya Mabuchi, and Shigeyuki Yamamoto, both of Toyonaka, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Dec. 31, 1979, Ser. No. 108,574
Claims priority, application Japan, May 16, 1978, 53-58539
Int. Cl.[3] B01D *1/12*
U.S. Cl. 159—5 1 Claim

1. An apparatus for concentrating polyvinyl alcohol liquid which comprises:

a supply line for supplying a liquid containing polyvinyl alcohol;

a filtering means in connection with said supply line for filtering foreign materials from said liquid;

a first tank for receiving said liquid after said liquid has passed through said filtering means;

a preliminary mixing apparatus in fluid connection with said first tank;

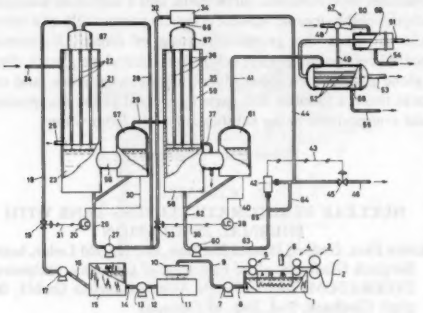
an evaporator in fluid connection with said preliminary mixing apparatus, said evaporator including a plurality of pipes through which said liquid may flow;

a steam heating means in connection with said evaporator for heating said liquid flowing through said plurality of pipes;

a second tank in fluid connection with said evaporator, said

second tank for receiving said liquid from said plurality of pipes within said evaporator;

a return pipe in fluid connection with said second tank for returning liquid contained within said second tank to said preliminary mixing apparatus such that said liquid may be combined within said preliminary mixing apparatus with said liquid from said first tank;



an outlet pipe in fluid connection with said second tank;

a viscometer in connection with said outlet pipe;

a regulating valve within said outlet pipe, said regulating valve being controlled by signals from said viscometer; and

a pipe for leading vaporized polyvinyl alcohol waste liquid outwardly from said evaporator.

4,289,578

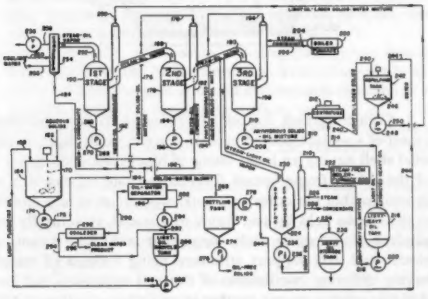
PROCESS AND APPARATUS FOR RECOVERING CLEAN WATER AND SOLIDS FROM AQUEOUS SOLIDS

Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Hanover Research Corporation, East Hanover, N.J.

Division of Ser. No. 719,515, Sep. 1, 1976. This application Nov. 14, 1979, Ser. No. 94,109

Int. Cl.³ B01D *1/26*

U.S. Cl. 159—47 WL **5 Claims**



1. A process for the recovery of clean water and substantially fluidizing oil-free solids from water-insoluble aqueous solids originally associated with a heavy, relatively non-volatile oil and dehydrated in an oil medium comprising the steps of (1) admixing an aqueous slurry of said solids with a low viscosity, relatively volatile, water-immiscible light fluidizing oil to obtain a mixture which will remain fluid and pumpable after the removal of the water content therefrom; (2) subjecting the resultant oil-containing mixture to dehydration by heat evaporation whereby substantially all the water and part of the light fluidizing oil are vaporized, yielding a mixed water and light oil vapor and a substantially anhydrous solids in oil slurry; (3) condensing said mixed water and light oil vapor; (4) separating the resultant condensate into a clean water fraction and a light oil fraction; (5) expressing at least some of the relatively volatile, water-immiscible light fluidizing oil and extracted heavy oil from said substantially anhydrous solids in oil slurry; (6) slurrying the resultant solids carrying residual light fluidizing oil with water; (7) heating the resultant slurry to convert a portion of said water to blowing steam which directly contacts said solids carrying residual light fluidizing oil, thereby facilitating the removal of substantially all the light oil therefrom; (8) allowing the solids in the resultant water-solids slurry to settle under the force of gravity; (9) removing the supernatant water from the settled solids, said solids having a reduced heavy oil content; (10) dividing the expressed light oil and extracted heavy oil of step (5) into a light oil fraction and a heavy oil fraction, and (11) combining the light oil fraction of step (10) with the separated light oil fraction of step (4) and admixing those combined fractions with fresh aqueous solids and thereby recycling them through the process as fluidizing oil.

4,289,579

METHOD FOR TREATING A BULK MATERIAL WITH A FLUID

Georg L. K. Forsberg, Nylandsgatan 14, 654 65 Karlstad, Sweden

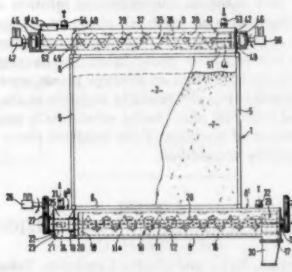
PCT No. PCT/SE78/00092, § 371 Date Aug. 10, 1979, § 102(e) Date Aug. 10, 1979, PCT Pub. No. WO79/00375, PCT Pub. Date Jun. 28, 1979.

This PCT application filed Dec. 11, 1978, Ser. No. 129,381

Claims priority, application Sweden, Dec. 12, 1977, 7714043

Int. Cl.³ D21C *1/02, 7/02*

U.S. Cl. 162—58 **5 Claims**



1. Method of treating a bulk of bulk material with a fluid, said method comprising treating the bulk material in a drum, which is surrounded by a bulk of the material to be treated, said drum including a plurality of openings distributed over the cylindrical face of the drum and a worm conveyor for said bulk material inside said drum, by feeding the bulk material into said drum through said openings while rotating said drum around its axis in said bulk of bulk material, introducing said fluid into the helicoidal space between said drum and said worm conveyor, rotating said worm conveyor at least at times in a direction opposite to that of the drum, to make the treatment of the bulk material more efficient due to the obtained loose packing of the bulk material in the drum and due to the fact that the bulk material is tumbled around, causing at least the main portion of the fluid to leave said drum through the same openings in the cylindrical face of the drum as those through which the bulk material is being fed in, and also treating material in the bulk material above the drum with the fluid passing through said openings in the drum.

4,289,580
HEAT SEAL FIBROUS WEB AND METHOD OF ITS MANUFACTURE

Colin Elston, Windsor, Conn.; Herbert A. Hoffman, and H. Joseph Murphy, both of Longmeadow, Mass., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed Nov. 13, 1979, Ser. No. 93,441
Int. Cl.³ D21H 5/02
U.S. Cl. 162—109 **17 Claims**

1. In a wet papermaking process for preparing a light weight multiphase heatsealable fibrous web material having excellent infusion characteristics comprising the steps of forming a dilute dispersion of heatsealable fibers in an aqueous dispersing medium; providing a fibrous substrate phase of non-heatsealing character; depositing said dispersion on said substrate phase while simultaneously removing a sufficient portion of said dispersing medium to form a partially dewatered heatsealable fiber phase superimposed on said substrate phase, said partially dewatered heatsealable phase having a fiber consistency of at least about one percent by weight with the remainder being substantially dispersing medium; and subsequently drying the resultant multi-phase web material to remove the dispersing medium and firmly secure the superimposed heatsealable phase to said substrate phase, the improvement wherein the heatsealable fibers are highly fibrillated synthetic thermoplastic particles and the process includes the step of disruptively dislodging and displacing portions of the heatseal particle in the partially dewatered heatseal fiber phase while superimposed on the fibrous substrate and prior to removing a major portion of the dispersing medium initially retained within said superimposed phase to provide a random array of discrete areas of reduced heatseal particle content and enhanced infusion in said multi-phase web material, the enhanced infusion areas being present throughout said heatseal phase at a concentration sufficient to occupy about 10–75 percent of the planar surface area of said heatseal fiber phase having an average diameter per area of up to 5 mm and an average planar area of at least $1\times10^{-3}cm^2$ and being substantially invisible in the dried web material, said substrate phase being substantially unaffected by the displacement of portions of the heatseal phase and being itself substantially unmodified.

4,289,581
MICROBICIDAL SLIMICIDE COMPOSITIONS FOR INDUSTRIAL USE

Sakae Katayama, Kobe, and Osamu Umekawa, Takatsuki, both of Japan, assignors to Katayama Chemical Works Co., Ltd., Osaka, Japan

Filed Mar. 23, 1979, Ser. No. 22,955
Claims priority, application Japan, Apr. 5, 1978, 53-40620; Apr. 11, 1978, 53-43697
Int. Cl.³ D21D 3/00; C02F 1/50; A61K 31/385
U.S. Cl. 162—161 **13 Claims**

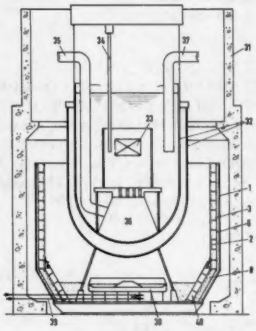
1. A stable microbicidal slimicide composition for industrial use which comprises 3–20 parts by weight of 4,5-dichloro-1,2-dithiol-3-one as active ingredient, at least 0.2 part by weight per 10 parts by weight of said active ingredient of a surfactant selected from the group consisting of N,N,N′,N′-polyoxyethylene polyoxypropylene-ethylenediamines and alkylolamides type nonionic surfactants, and a sufficient amount of a hydrophilic organic solvent consisting essentially of a solvent selected from the group consisting of dimethylformamide, methyl cellosolve, phenyl cellosolve, diethylene glycol, dipropylene glycol, diethylene glycol monomethyl ether, and mixtures thereof to make 100 parts by weight of the composition, said composition being substantially free from water.

13. In a method for controlling slime formation in wood pulp or paper manufacture, having a water system the improvement comprising adding a slimicide composition to said water system which is composed of 3–20 parts by weight of 4,5-dichloro-1,2-dithiol-3-one as active ingredient, at least 0.2 part by weight per 10 parts by weight of said active ingredient of a surfactant selected from the group consisting of N,N,N′,N′-polyoxypropylene polypropylene-ethylenediamines and alkylolamides type nonionic surfactants, and a sufficient amount of a hydrophilic organic solvent consisting essentially of a solvent selected from the group consisting of dimethylformamide, methyl cellosolve, phenyl cellosolve, diethylene glycol, dipropylene glycol, diethylene glycol monomethyl ether, and mixtures thereof to make 100 parts by weight of the composition, said composition being substantially free from water.

4,289,582
NUCLEAR REACTOR COLLECTING TANK WITH THERMAL INSULATION

Armin Parr, Godorf; Harald Kleffner, and Harald Leder, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to INTERATOM, Internationale Atomreaktorbau GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Sep. 15, 1978, Ser. No. 942,645
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741795
Int. Cl.³ G21C 9/00
U.S. Cl. 176—38 **4 Claims**



1. Collecting tank for coolant escaping from a demolished vessel of a sodium-cooled nuclear reactor, comprising an outer steel shell having an inner lining of blocks stacked one on top of the other, frame means for holding said blocks at a side thereof within the collecting tank, support structure common to the blocks held by said frame means and, structurally independent of said outer shell, supporting said frame means, said blocks and said support structure being formed of material having different coefficients of thermal expansion and being shiftable relative to one another in accordance with said different coefficients of thermal expansion, a base ring fastened to said support structure, a roller-carrying intermediate ring disposed on said base ring and being rollably shiftable in a radial direction relative to said base ring, a support ring extending circumferentially within said outer shell and carrying said frame means, said support ring being divided into a plurality of sectors, each of which is rollably shiftable in radial direction relative to said intermediate ring, stop means carried by said base ring, and a lever for each of said sectors mounted on said intermediate ring and having one end thereof deflectable by said stop means and the other end thereof braced against said support ring.

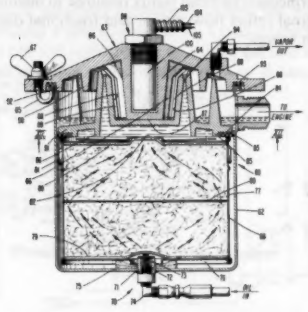
4,289,583
OIL RECLAMATION DEVICE

Gary C. Engel, 123 NW. 109th St., Miami Shores, Fla. 33168

Continuation-in-part of Ser. No. 852,976, Nov. 18, 1977, Pat. No. 4,189,351. This application Aug. 20, 1979, Ser. No. 68,311

Int. Cl.[3] B01D *3/28, 27/08;* C10G *7/00*

U.S. Cl. 196—115 28 Claims



1. An oil reclamation device having a longitudinal axis and comprising:

(a) a housing means having a container, a cover means, an oil inlet, an oil outlet means and a vapor removal vent means,

(b) filter means and evaporator plate means disposed in said container, said filter means including rigid canister means having an upper peripheral edge,

(c) heating means attached to said cover means,

(d) said evaporator plate means including an upper and a lower side, said upper side having a vaporizing surface along which oil passes in a thin film and said lower side facing downwardly toward said canister means,

(e) said cover means including a heat transmitting member and defining an evaporation chamber between the cover means and the evaporator plate means,

(f) said lower side of the evaporator plate means including an annularly disposed outer peripheral seat for receiving resilient sealing means disposed between the evaporator plate means and the canister means, said sealing means being located along the entire periphery of the evaporator plate means to prohibit bypassing of fluids between the plate means and the container,

(g) said evaporator plate means including passageway means extending from the filter means to deliver substantially all of the oil being treated into said evaporation chamber in a thin film along the vaporizing surface, and

(h) fastening means for resiliently securing the cover means to the top of the container against the resilience of the sealing means,

(i) a portion of the inside of the cover means being in contact with a portion of the upper side of the evaporator plate means to sealingly urge the evaporator plate means against the filter means with said resilient sealing means therebetween.

4,289,584
COKE QUENCHING PRACTICE FOR ONE-SPOT CARS

David M. Chuss, and James W. Scheirer, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 20,682, Mar. 15, 1979, Pat. No. 4,201,627. This application Dec. 3, 1979, Ser. No. 99,698

The portion of the term of this patent subsequent to May 6, 1997, has been disclaimed.

Int. Cl.[3] C10B *39/12, 33/00, 39/04*

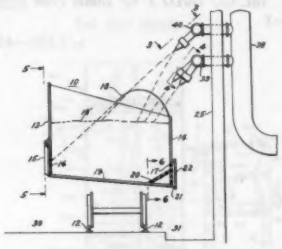
U.S. Cl. 201—39 12 Claims

1. A process for quenching coke in which coke is pushed from a coke oven into a one-spot quench car and the quench car is provided with openings adjacent the quench car bottom, comprising the steps of:

(a) providing a plurality of sets of full cone spray nozzles with each nozzle having a spray angle in the range of about 15° to about 25° to dispense a quench liquid in a full coverage spray pattern to quench the coke,

(b) applying the quench liquid from a first set of spray nozzles in a first pattern,

(c) substantially simultaneously with step (b) applying the



quench liquid from a second set of spray nozzles in a second pattern to impact upon areas of the coke surface not covered by the first set of spray nozzles, so that the sum of the areas contacted by the first pattern and the areas contacted by the second pattern equals about 50% to about 70% of the substantially level, exposed surface area of coke in the quench car, and

(d) providing sufficient openings to drain the quench liquid from the quench car and to prevent the buildup of quench liquid in the bottom of the quench car.

4,289,585
METHOD AND APPARATUS FOR THE WET QUENCHING OF COKE

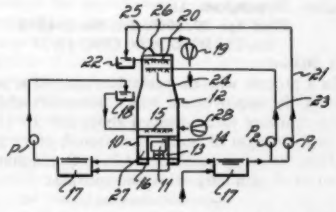
Dietrich Wagener; Claus Flockenhaus, and Manfred Blase, all of Essen, Fed. Rep. of Germany, assignors to Didier Engineering GmbH, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,439

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1979, 2915330

Int. Cl.[3] C10B *39/10*

U.S. Cl. 202—227 6 Claims



1. In an apparatus for the wet quenching of coke including a quenching tower having an interior for receiving hot coke in a quenching car, first spray means above the hot coke for spraying the hot coke with quenching water in a hot coke quenching operation, second spray means in the upper portion of the tower for spraying the steam produced by spraying the hot coke with water for condensing the steam, and means at the bottom of the quenching tower for collecting the mixture of steam condensate and unevaporated quenching water, the improvement comprising third spray means located in the upper portion of the quenching tower and pump means for circulating the collected condensate-water mixture to said third spray means for spraying said condensate-water mixture

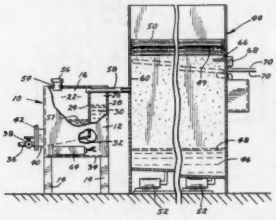
in said quenching tower between periods of the hot coke quenching operation to cool said condensate-water mixture.

4,289,586

SOLVENT RECOVERY METHOD

Winston E. Sabatka, Lakeville, Minn., assignor to Finishing Equipment, Inc., St. Paul, Minn.

Division of Ser. No. 894,045, Apr. 6, 1978, Pat. No. 4,204,913.
This application Oct. 12, 1979, Ser. No. 84,518
Int. Cl.³ B01D *3/42*; B08B *7/04*
U.S. Cl. 203—1 **6 Claims**



1. A method of safely removing from a closed boiling vessel most of a first volatile fluid having at least some volatile constituents which are flammable in vapor phase from a mixture of such fluid and not so volatile constituents in said vessel including the steps of:

(a) providing an open treatment tank with a second volatile, non-flammable fluid therein, said second fluid being so constituted when heated as to initially form a vapor phase that is heavier than air and which is more volatile than the vapor phase of the flammable constituents of said first fluid;

(b) heating said second volatile fluid in said tank to form said second fluid into a liquid phase and a vapor phase over the liquid phase;

(c) continually heating said mixture in said vessel to cause said first fluid to vaporize progressively; and

(d) introducing this vapor from said first fluid continuously into the vapor phase of said second fluid in said tank.

4,289,587

STABILIZATION OF CHLORINATED PHENOLS

Ray C. Christena, Wichita, Kans., assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Apr. 29, 1980, Ser. No. 144,880
Int. Cl.³ B01D *3/34*; C07C *37/74*
U.S. Cl. 203—6 **20 Claims**

17. In a process wherein pentachlorophenol is purified by distillation, the improvement which comprises adding to the pentachlorophenol to be distilled about 0.01 to 1.0 percent, based on the weight of pentachlorophenol, of a stabilizer selected from the group consisting of C_4 to C_{30} unsaturated fatty acids, esters of such fatty acids, and epoxides.

4,289,588

FRACTIONAL DISTILLATION COLUMN PUMPAROUND HEAT REMOVAL CONTROL

James A. Hofferber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 60,570, Jul. 25, 1979, Pat. No. 4,246,070.
This application Jul. 30, 1980, Ser. No. 173,577
Int. Cl.³ B01D *3/42*
U.S. Cl. 203—2 **10 Claims**

1. A method for controlling the internal reflux flow rate in a fractional distillation column means comprising the steps of:

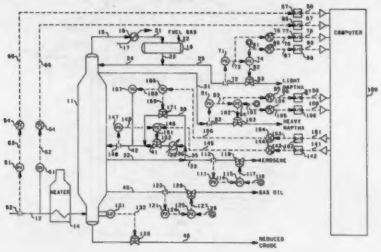
supplying a feed to said fractional distillation column means;

supplying heat to said fractional distillation column means;

withdrawing a sidedraw stream from an intermediate portion of said fractional distillation column means;

recycling at least a portion of said sidedraw stream to an intermediate portion of said fractional distillation column means as intermediate external reflux for said fractional distillation column means;

using at least computing means to establish a first signal representative of a prediction of the flow rate of said intermediate external reflux required to maintain a desired internal reflux flow rate in said fractional distillation column means;



establishing a second signal representative of the actual flow rate of said intermediate external reflux;

using computing means to compare said first signal and said second signal and establishing a third signal responsive to the difference between said first signal and said second signal; and

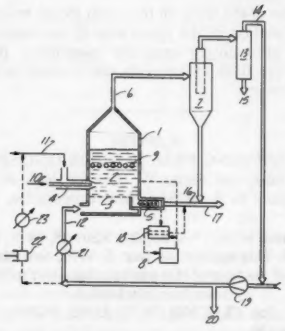
manipulating the flow rate of said intermediate external reflux in response to said third signal to thereby maintain a desired internal reflux flow rate in said fractional distillation column means.

4,289,589

SEPARATING TOLUENE DIISOCYANATE AND/OR HIGHER BOILING SOLVENTS FROM DISTILLATION RESIDUES OF THE TOLUENE DIISOCYANATE MANUFACTURE USING A FLUIDIZED BED

Waldemar Koehler, Frankenthal, Fed. Rep. of Germany; Bernd Blumenberg, East Baton Rouge, La.; Ludwig Vogel, Frankenthal, and Eckhard Hetzel, Bobenheim-Roxheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 31, 1980, Ser. No. 135,303
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1979, 2915830
Int. Cl.³ B01D *3/10*; C07C *119/04*
U.S. Cl. 203—49 **9 Claims**



9. A process for the separation of toluene diisocyanates and/or higher boiling solvents from distillation residues ob-

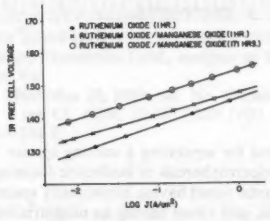
tained during the reaction of toluene diamine with phosgene in the presence of solvents and subsequent distillation of the reaction solution comprising establishing a fluidizing bed by placing an initial material of an average particle size of 0.5 micron to 5000 microns into a fluidized bed reactor; feeding a fluidizing gas to establish a specified void faction of 0.4 to 0.75, at a velocity of 0.1 meter per second to 2 meters per second at normal conditions of 20° C. and 760 mmHg and which said fluidizing gas is recycling nitrogen; injecting the distillation residue containing a desired product by a two-product jet into the fluidized bed and injecting the atomizing gas into the fluidized bed with a supply pressure of 1.5 bars to 10 bars.

4,289,590
Patent Not Issued For This Number

4,289,591
OXYGEN EVOLUTION WITH IMPROVED MN STABILIZED CATALYST

Craig R. Davidson, Hampstead, N.H., and John M. Sedlak, Andover, Mass., assignors to General Electric Company, Wilmington, Mass.

Filed May 2, 1980, Ser. No. 145,955
Int. Cl.³ C25B *1/10, 1/16, 11/08, 11/16*
U.S. Cl. 204—129 **12 Claims**


RUTHENIUM OXIDE (1 HR.)
RUTHENIUM OXIDE / MANGANESE OXIDE (1 HR.)
RUTHENIUM OXIDE / MANGANESE OXIDE (17 HRS.)
IR FREE CELL VOLTAGE
LOG J(A/cm²)

1. In a method for electrolytically generating oxygen comprising:

(a) providing a catalytic cathode;

(b) providing a catalytic oxygen evolving anode;

(c) positioning a solid polymer electrolyte ion transporting membrane between the cathode and the anode, the cathode being bonded to one surface of the membrane and the anode being bonded to the other surface of the membrane; and,

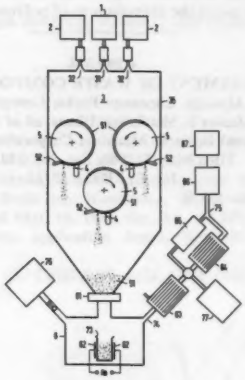
(d) providing a direct potential between the cathode and the anode and supplying water to one of the electrodes to be acted on electrochemically to evolve oxygen at the anode;

the improvement comprising providing a catalyst at the oxygen evolving anode comprising ruthenium oxide and manganese oxide.

4,289,592
METHOD OF SEPARATING ISOTOPE COMPOUNDS BY SELECTIVE EXCITATION AND REACTION IN A SOLID MATRIX

Karl Janner; Klaus Gregorius, and Reinhold Müller, all of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Apr. 11, 1978, Ser. No. 895,510
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1977, 2718030
Int. Cl.³ B01D *59/34*
U.S. Cl. 204—157.1 R **8 Claims**



1. In a method for the separation of an isotope substance from a vaporous mixture of isotope substances, by selective excitation at low temperatures of one isotope compound by electromagnetic radiation having a wavelength and energy density to effect a chemical reaction between the excited one isotope compound and an added reaction partner to produce a reaction product the improvement comprising:

(a) adiabatically expanding a body of the vaporous mixture of isotope compounds separate from the vaporous reaction partner to cool the mixture of isotope compounds to a temperature below 100K.,

(b) adiabatically expanding a body of vaporous reaction partner in excess of that required for reaction with the excited isotope compound, separate from the vaporous mixture of isotope compounds to cool the vaporous reaction partner to a temperature below 100K.,

(c) mixing the cooled mixture of isotope compounds and the cooled reaction partner together in a zone at a temperature below 100K.,

(d) condensing the reaction partner in the zone to form particles of solid matter, into which particles of the mixture of isotope compounds are incorporated,

(e) subjecting the solid matter of reaction partner and mixture of isotope compounds to electromagnetic radiation to selectively excite the one isotope compound and effect selective reaction of the excited isotope compound with the condensed reaction partner to produce a reaction product which contains predominantly the one isotope, and

(f) separating a compound of the one isotope from the reaction mixture.

4,289,593

METHOD FOR INCREASING THE ULTRA-VIOLET LIGHT TRANSMITTANCE OF ETHYLENE GLYCOL

Robert G. Briody, and Frances M. Cummings, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 25,306, Mar. 30, 1979, abandoned. This application Mar. 5, 1980, Ser. No. 127,292

Int. Cl.³ C07C *31/20*

U.S. Cl. 204—158 R **4 Claims**

1. A process for treating ethylene glycol containing ultraviolet absorbing impurities so as to improve the ultraviolet light transmittance characteristics of the ethylene glycol at wavelengths in the range of 220 to 350 nanometers by irradiating the ethylene glycol with ultraviolet radiation, at a wavelength not less than 220 nanometers, from a controllable ultraviolet radiation emission source for a time sufficient to obtain ethylene glycol having ultraviolet light transmittance characteristics suitable for use in the manufacture of polyester fibers.

4,289,594

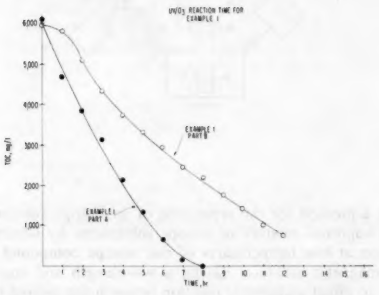
TREATMENT OF WASTE COMPOSITIONS

Warren A. Alpaugh, Chenango Forks; George J. Macur, Endwell, and James E. Sharkness, Ithaca, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 9, 1980, Ser. No. 148,345

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **17 Claims**



1. A process for treating liquid waste composition containing copper ions and an organic complexing agent for the copper ions which comprises:

reducing the concentration of copper ions in the waste composition to less than 8 ppm; then contacting the waste composition with an ozone-containing gas in an amount effective to react with and destroy said organic complexing agent; and irradiating said waste composition with ultraviolet light.

4,289,595

AMBIENT TEMPERATURE CURING PHOTOPOLYMERIZABLE EPOXIDE COMPOSITIONS UTILIZING EPOXIDE ETHERS AND METHODS

Anthony J. Tortorello, Elmhurst, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Nov. 26, 1979, Ser. No. 97,399

Int. Cl.³ C08G *59/68*

U.S. Cl. 204—159.11 **10 Claims**

1. A photopolymerizable epoxide comprising:

A. 50–99.9 percent by weight polymerizable epoxide compounds, at least 25 percent by weight of such epoxide compounds being an epoxide ether compound selected from the group consisting of 1,4-bis[(2,3-epoxypropoxy)-methyl]-cyclohexane and 1,10-decamethylenedioxy-bis-(2,3-epoxypropane); and

B. At least 0.1 percent by weight of a photoinitiator soluble in said epoxide compounds and decomposable upon exposure to electromagnetic radiation to provide a Lewis acid to initiate polymerization of said epoxide compounds, said composition being curable to a tack-free condition at ambient temperatures upon exposure to electromagnetic radiation for a period of 0.5 to 60 seconds.

4,289,596

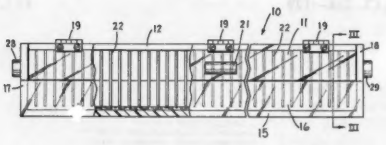
HORIZONTAL ELECTROPHORESIS OR ISOELECTRIC FOCUSING APPARATUS AND METHOD OF USING SAME

Paul S. Satoh, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 29,063, Apr. 11, 1979, Pat. No. 4,234,404. This application May 27, 1980, Ser. No. 153,233

Int. Cl.³ G01N *33/16, 27/26*

U.S. Cl. 204—180 R **5 Claims**

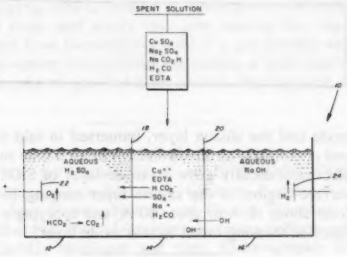


1. A method for separating a starting species into separate fractions by electrophoresis or isoelectric focusing, in an elongated, horizontal vessel having horizontally spaced-apart electrodes therein, said vessel having an unobstructed zone along its bottom and having a multiplicity of upright, generally parallel, horizontally spaced-apart partitions defining a multiplicity of separate compartments above said zone, which comprises the steps of: depositing a quantity of said starting species carried in a liquid electrophoresis or isoelectric focusing medium in said zone to form a stationary liquid layer in said zone which layer is in contact with said electrodes; then applying an electrophoresis or isoelectric focusing potential across said electrodes for a period of time effective to cause said species to migrate electrophoretically in a horizontal direction in said layer to separate said species into fractions which are horizontally displaced from one another in a direction lengthwise of said vessel; then turning said vessel about its horizontal longitudinal axis whereby to cause said layer to flow into said compartments so that the respective fractions become separated from each other and are located in different ones of said compartments.

4,289,597
PROCESS FOR ELECTRODIALYTICALLY REGENERATING AN ELECTROLESS PLATING BATH BY REMOVING AT LEAST A PORTION OF THE REACTED PRODUCTS

David W. Grenda, Houston, Pa., assignor to Electrochem International, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 17,086, Mar. 5, 1979, abandoned. This application Feb. 19, 1980, Ser. No. 122,242
Int. Cl.[3] B01D *57/02*
U.S. Cl. 204—180 R 7 Claims



1. In a process for electrodialytically regenerating a spent electroless copper plating bath resulting from the reduction of a water soluble cupric salt in an alkaline solution under copper plating and reducing conditions, said spent solution containing alkali metal salts as reaction products,

(a) conducting said spent solution to a regeneration compartment of an electrodialytic cell,

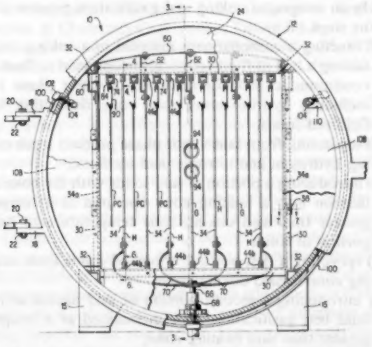
(b) establishing and maintaining an aqueous electrolyte as the anolyte of said electrodialytic cell in an anode compartment which has in common one wall with said regeneration compartment that is composed of a permselective anionic membrane, and

(c) electrodialytically transferring anions of said alkali metal salts in the spent solution through said anionic membrane from the regeneration compartment to the anode compartment.

4,289,598
PLASMA REACTOR AND METHOD THEREFOR

Frank W. Engle, Pleasanton, Calif., assignor to Technics, Inc., Alexandria, Va.

Filed May 23, 1980, Ser. No. 152,688
Int. Cl.[3] C23C *15/00;* C23F *1/00*
U.S. Cl. 204—192 E 19 Claims



1. A plasma reactor suitable for conditioning workpieces in gas discharge plasma, comprising:

a vacuum vessel having a chamber therein;

a series of parallel disposed electrodes supported in said vacuum vessel chamber, said series of electrodes adapted to have alternate polarities; and

means for supporting workpieces to be conditioned in said plasma reactor between adjacent electrodes of said series of electrodes, said supporting means disposed in said vacuum vessel chamber and electrically isolated from said electrodes.

18. In the method of conditioning workpieces in a gas discharge plasma utilizing a plasma reactor having a vacuum vessel with a chamber therein and a series of parallel disposed electrodes supported in said chamber, the steps comprising:

disposing each workpiece between a pair of adjacent electrodes of said series of electrodes and electrically isolated therefrom;

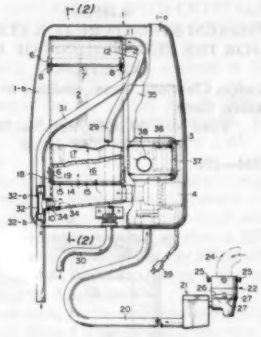
causing said series of electrodes to be of alternate polarities; and

generating a gas discharge plasma in said chamber.

4,289,599
APPARATUS FOR PRODUCING ALKALINE WATER AND ACIDIC WATER

Tomotsuru Fushihara, Tokyo, Japan, assignor to Kabushiki Kaisha Kogai Boshi Sogo Kenkyusho, Tokyo, Japan

Filed Mar. 10, 1980, Ser. No. 128,883
Claims priority, application Japan, Nov. 30, 1979, 54-165629[U]
Int. Cl.[3] C25B *9/00, 1/22;* C02F *1/46*
U.S. Cl. 204—275 11 Claims

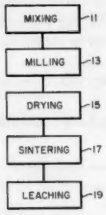


11. An apparatus for the instantaneous and continuous electrolyzation of water to produce alkaline water and acidic water which comprises a container which houses an electrolytic cell, said electrolytic cell containing a lower chamber provided with a water inlet zone and a water outlet zone, said lower chamber having a bottom which is inclined downwardly from the water inlet zone to the water outlet zone, and an upper chamber containing anode plates and cathode plates disposed in a spaced apart predetermined relationship, inlet means for introducing water into the water inlet zone of the lower chamber of said electrolytic cell, said inlet means including a quantitative valve means, first and second outlet means disposed at the upper end portion of the upper chamber for removing alkaline water and acidic water respectively, therefrom, said first outlet means provided with means for discharge from the apparatus, and said second outlet means provided with means for communicating with the water outlet zone for discharge from the apparatus, and electrical means for providing the necessary electrical power to the apparatus.

4,289,600
MICROPOROUS MEMBRANE MATERIALS

Christine A. Lazarz; Edward H. Cook, Jr., both of Niagara Falls, N.Y., and Lesleigh V. Scripa, West Willington, Conn., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 891,987, Mar. 31, 1978, Pat. No. 4,170,540. This application Aug. 7, 1979, Ser. No. 64,616
The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.
Int. Cl.[3] C25B *13/08;* B29D *27/00;* C25B *1/26*
U.S. Cl. 204—296 22 Claims



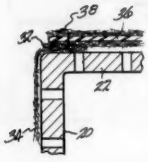
1. A process for the preparation of a sheet material suitable for use as a separator for an electrolytic cell which comprises: (a) forming a sheet from a composition comprising a fluorocarbon polymer, a pore forming additive and a fluorinated surface active agent; (b) sintering the sheet; and (c) removing the pore forming additive, to form a microporous sheet.

7. A product of the process of claim 1.

4,289,601
DIAPHRAGM STRUCTURE FOR ELECTROLYTIC CELLS FOR THE ELECTROLYSIS OF AQUEOUS SALT SOLUTIONS

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 30, 1979, Ser. No. 99,047
Int. Cl.[3] C25B *13/08*
U.S. Cl. 204—296 8 Claims



1. A diaphragm for electrolytic cells for the electrolysis of aqueous salt solutions which comprises an electrochemically active porous portion attached to an electrochemically inactive fluid impervious portion, said electrochemically inactive fluid impervious portion being comprised of a fabric layer attached to a fluid impervious film layer.

4,289,602
ELECTROCHEMICAL OXIDATION OF AMORPHOUS SILICON

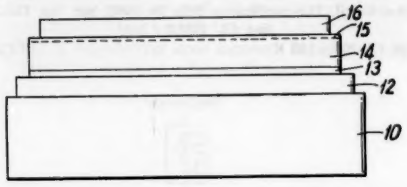
Joseph L. Sansregret, Scotch Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 15, 1980, Ser. No. 150,243
Int. Cl.[3] C25D *5/00;* H01L *31/04*
U.S. Cl. 204—32 S 7 Claims

1. A method for producing a device comprising hydrogenated amorphous silicon, comprising the steps of:

etching a surface region of said silicon to provide a standard surface;

anodizing said etched surface in an electrolyte comprising an anodizing anion in solution with a solvent having a dielectric constant greater than or equal to about 25 wherein an electrolysis current is maintained between a cathode elec-

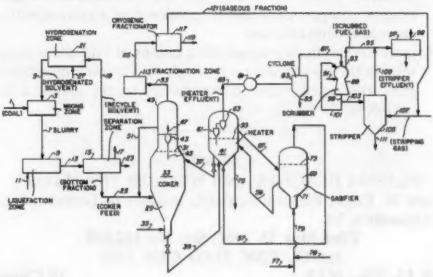


trode and the silicon layer, immersed in said electrolyte and comprising an anode electrode, for a time sufficient to electrochemically grow an oxide layer of SiOx from the surface region of the silicon layer ranging in thickness from about 10 A to about 50 A; and applying a Schottky junction forming metal to said oxide layer.

4,289,603
CRYOGENIC FRACTIONATOR GAS AS STRIPPING GAS OF FINES SLURRY IN A COKING AND GASIFICATION PROCESS

Charles W. DeGeorge, Chester, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 30, 1978, Ser. No. 910,450
Int. Cl.[2] C10G *1/04, 9/32;* C10K *1/08*
U.S. Cl. 208—8 LE 18 Claims



1. In an integrated coking and gasification process comprising the steps of:

(a) reacting a carbonaceous material in a coking zone containing a bed of fluidized solids maintained at fluid coking conditions to produce coke and a vapor phase product including hydrocarbons, said coke depositing on said fluidized solids;

(b) separating from said vapor phase product a gas comprising hydrogen and nitrogen and methane;

(c) introducing a portion of said solids with the coke deposit thereon into a heating zone operated at a temperature greater than said coking zone temperature to heat said portion of solids;

(d) recycling a first portion of heated solids from said heating zone to said coking zone;

(e) introducing a second portion of said heated solids to a fluid bed gasification zone maintained at a temperature greater than said heating zone;

(f) reacting said second portion of heated solids in said gasification zone with steam and an oxygen-containing gas to produce a hot gaseous stream comprising hydrogen;

(g) introducing said hot gaseous stream comprising hydrogen and entrained solids into said heating zone;
(h) passing an additional stream of solids from said gasification zone to said heating zone;
(i) recovering from said heating zone the resulting cooled gaseous stream comprising hydrogen, acidic gases and entrained solids;
(j) separating at least a portion of said entrained solids from said cooled gaseous stream of step (i);
(k) scrubbing the resulting gaseous stream containing said solids with a liquid to form a liquid-solids slurry containing acidic gases and recovering a scrubbed fuel gas;
(l) contacting the liquid-solids slurry with a stripping gas in a stripping zone to remove at least a portion of the acidic gases from said slurry and then passing the vaporous effluent from the stripping zone to a gas cleanup unit, the improvement which comprises passing at least a portion of said separated gas of step (b) to said stripping zone of step (l).

4,289,604

METHOD OF PRODUCING AN ISOTROPIC COKE

Georg Kölling, Essen-Bredeney; Gerhard Pietzka, Vockenhausen; Ingo Romey, Hünxe, and Harald Tillmanns, Kelkheim, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Meitingen and Sigri Elektrographit GmbH, Essen, both of, Fed. Rep. of Germany

Filed Mar. 31, 1977, Ser. No. 783,030

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614541

Int. Cl.³ C10B *55/00*

U.S. Cl. 208—106 **2 Claims**

1. Method for manufacturing an isotropic coke, which comprises subjecting tar from
(a) low temperature carbonization of bitumen,
(b) having a hydrogen content of more than 5.5%,
(c) a carbon content of less than 88% and a softening point above 60° C., to
(d) filtration to remove solid particles therefrom, and
(e) heating the filtrate to a temperature between about 900° C. and 1300° C., to convert the filtrate to an isotropic coke characterized by a thermal volume expansion coefficient of about 13.5×10^{-6}/K and a degree of anisotropy of less than 1.2,
(f) wherein said filtrate is heated to 350° C. with a temperature gradient of 100° to 300° C./hr, from 350° to 460° C. with a gradient of 5° to 50° C./hr and from 460° to 900° to 1300° C. with a gradient of more than 50° C./hr.

4,289,605

CATALYTIC CRACKING OF METAL CONTAMINATED MINERAL OIL FRACTIONS

David B. Bartholic, Watchung, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 935,890, Aug. 23, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,252

Int. Cl.³ C10G *11/18*

U.S. Cl. 208—113 **11 Claims**

1. In a process for catalytic cracking of a metal-containing hydrocarbon charge by contacting the charge at cracking temperature with a particle form solid cracking catalyst whereby components of the charge are converted to lower boiling hydrocarbons with concurrent deposition on the catalyst of metals from the charge and of an inactivating carbonaceous contaminant, regenerating catalytic cracking activity of the contaminated catalyst by burning carbonaceous deposit therefrom while retaining metals deposited on the catalyst, and contacting catalyst so regenerated with additional such charge, whereby the catalyst accumulates metal to detriment of the cracking reaction and declines in regenerated activity over repeated cycles of charge contact and regeneration; the average activity and metals content of the catalyst inventory being maintained at substantially constant equilibrium values by replacing a portion of the catalyst inventory with fresh catalyst of activity above and metals content below said equilibrium values;

the improvement whereby said equilibrium values of activity and metals content are decoupled which comprises replacing a portion of said catalyst as aforesaid by adding part of such replacement as catalyst of activity above and metals content below said equilibrium values and the remainder as inert porous solid particles of metals content below said equilibrium value and physical characteristics like that of said catalyst and varying the ratio between fresh catalyst and inert particles for separate control of said equilibrium value.

4,289,606

HYDROCARBON CRACKING WITH MIXTURE OF ZEOLITES Y AND ZSM-5

Elroy M. Gladrow, and William E. Winter, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 44,394, May 31, 1979, Pat. No. 4,239,654. This application Mar. 19, 1980, Ser. No. 131,646

Int. Cl.³ C10G *11/05*

U.S. Cl. 208—120 **12 Claims**

1. A catalytic cracking process which comprises contacting a hydrocarbonaceous feed at catalytic cracking conditions in the absence of added hydrogen with a catalyst comprising:
(a) an ultrastable Y-type crystalline alumino-silicate zeolite having less than about 1 weight percent rare earth metals, calculated as the elemental metal, based on the zeolite;
(b) a small pore crystalline ZSM-5 type zeolite; and
(c) a catalytic inorganic oxide matrix.

4,289,607

CATALYTIC CONVERSION WITH CRYSTALLINE ZEOLITE PRODUCT CONSTITUTING ZSM-5/ZSM-11 INTERMEDIATES

George T. Kokotailo, Woodbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 28,482, Apr. 9, 1979 Pat. No. 4,229,424. This application Jun. 5, 1980, Ser. No. 156,702

Int. Cl.³ C10G *11/02, 35/04;* **C07C** *2/68*

U.S. Cl. 208—120 **18 Claims**

1. A process for conversion of an organic charge which comprises contacting the same under conversion conditions with a catalyst comprising a crystalline porous tectosilicate characterized by a structure intermediate that of ZSM-5 and ZSM-11 having in its sodium form, an X-ray diffraction pattern substantially as shown in Table 1 and having a unit cell parameter of at least about 40 Angstroms.

5. The process of claim 1 wherein reformates are upgraded.

7. The process of claim 1 wherein said conversion involves alkylation of aromatic hydrocarbon.

4,289,608

PROCESS FOR CATALYTICALLY CRACKING METALS-CONTAINING HYDROCARBON FEEDSTOCKS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 7, 1978, Ser. No. 967,225

Int. Cl.³ C10G *9/16;* **B01J** *8/24;* **C01B** *1/09*

U.S. Cl. 208—121 **22 Claims**

1. In a catalytic cracking process wherein a metal contaminants-containing hydrocarbon feedstock is converted in a catalytic cracking reaction zone to more valuable hydrocarbons of lower average molecular weight and boiling point by contact with cracking catalysts particles at an elevated temperature, the improvement comprising adding one or more organic aluminum compounds into the hydrocarbon feedstock entering the catalytic cracking reaction zone, said feedstock containing between about 5 and 50 wppm of metals contaminants.

4,289,609

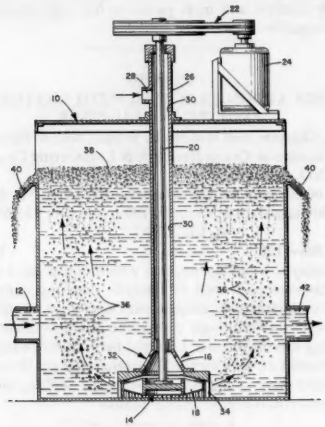
PROCESS FOR REMOVING SOLID ORGANIC MATERIALS AND OTHER IMPURITIES FROM WET-PROCESS PHOSPHORIC ACID

Ralph E. Worthington, Winter Haven; Donald A. Luke, Temple Terrace, and Stanton L. Reese, Lakeland, all of Fla., assignors to Uranium Recovery Corporation, Mulberry, Fla.

Filed May 2, 1978, Ser. No. 902,105

Int. Cl.[3] B03B *1/02*

U.S. Cl. 209—11 **19 Claims**



1. A process for removing solid organic material from wet-process phosphoric acid derived from the acidulation of uncalcined phosphate rock by froth flotation comprising:

(a) mixing the wet-process phosphoric acid and introducing gas into the wet-process phosphoric acid during the mixing to produce a foam containing at least a portion of the solid organic material; and

(b) withdrawing the foam from the phosphoric acid.

4,289,610

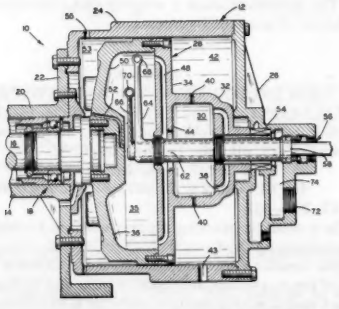
APPARATUS FOR PUMPING AND CONDITIONING DRILLING FLUID

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., City of Commerce, Calif.

Filed Mar. 23, 1979, Ser. No. 23,207

Int. Cl.[3] B04B *11/00*; B01D *45/12*

U.S. Cl. 209—18 **3 Claims**



1. A centrifugal pump for selectively separating different weight components of a liquid-solids mixture comprising: a stationary outer housing having an inlet communicating with the interior of said housing; a rotor assembly having a first and a second chamber spaced apart by a common wall, said first chamber being defined by a first casing and a portion of one side of said common wall, said first casing having a wall portion integral with said common wall and extending toward said housing inlet and terminating in spaced relation from said common wall, outlet means providing communication between said first chamber and the exterior of said housing, radially extending acceleration passages in the end wall of said first casing providing communication between the inlet of said housing and the radially outer peripheral interior of said first chamber, said second chamber being defined by a second casing and the opposite side of said common wall, said second casing having a wall portion integral with and extending in an opposite direction from the wall portion of said first casing and terminating in spaced relation from said common wall, radially extending acceleration passages in said common wall providing communication between the radially inner portion of the interior of said first chamber and the radially outer portion of the interior of said second chamber; a first pickup stationarily mounted within said second chamber having a pickup inlet positioned near the periphery of said second chamber for collecting components of the liquid-solids mixture; a second pickup stationarily mounted within said second chamber having a pickup inlet positioned inwardly of the pickup inlet of said first pickup means for collecting components of the liquid-solids mixture of a weight different from the weight of the components collected by said first pickup means; outlet means from said housing; means providing communication between said first and second pickup means and said outlet means disposed to extend axially of said rotor assembly; and means for rotatingly supporting said rotor assembly to permit rotation thereof relative to said outer housing about an axis parallel to said communication means.

4,289,611

MULTI-STAGE CYCLONE SEPARATOR

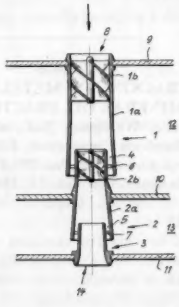
Heinz Brockmann, Homburg, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz Akt., Cologne, Fed. Rep. of Germany

Filed May 5, 1980, Ser. No. 146,274

Claims priority, application Fed. Rep. of Germany, May 10, 1979, 2918765

Int. Cl.[3] B01D *45/12*

U.S. Cl. 209—144 **4 Claims**



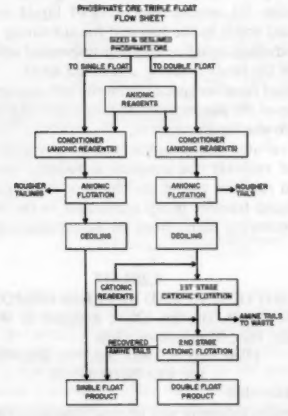
1. A vortex separator, operating as a dust filter system for air intake machines, such as gas turbines and other internal combustion engines, comprising dust filters including first and second casings arranged coaxially and having upstream and downstream ends, said upsteam end of said first casing having a predetermined diameter and said upstream end of said second casing having a diameter less than said predetermined diameter, first and second helical bladed inserts respectively mounted within and having corresponding diameters to said upstream ends of said casings, said inserts having blades ori-

ented for effecting air rotation in the same direction, said blades of said second insert having a pitch greater than the blade pitch of said first insert for increasing the swirl of the air entering said second casing, an air outlet connector having upstream and downstream ends and extending coaxially of said downstream end of said second filter, said upstream end of said connector having a diameter less than said upstream end of said second casing, said downstream end of said first casing surrounding and having a larger diameter than said upstream end of said second casing to thereby form a first annular space therewith, said downstream end of said second casing surrounding and having a larger diameter than said upstream end of said air outlet connector to thereby form a second annular space therewith, whereby air containing dust particles of various grain sizes enters said upstream end of said first filter and is subjected to a centrifugal force by said first insert, the dust particles having larger grain sizes first impacting against the inner wall of said first casing and thereby exiting through said first annular space, the dust particles having relatively smaller grain sizes entering said upstream end of said second filter and being subjected to a further centrifugal force by said second insert, the dust particles having grain sizes smaller than said larger sizes first impacting against the inner wall of said second casing and thereby exiting through said second annular space, the dust particles having grain sizes still smaller than said smaller sizes being discharged through said outlet connector.

4,289,612
PHOSPHATE ORE TRIPLE FLOAT

Glenn H. Schrieber, Aurora, N.C., assignor to Texasgulf Inc., Stamford, Conn.

Filed Jun. 11, 1980, Ser. No. 158,380
Int. Cl.³ B03D *1/02*
U.S. Cl. 209—166 **5 Claims**



1. An improved process for the beneficiation of phosphate ore wherein the ore is floated with anionic reagent to produce a single float product, the single float product is treated with acid to remove anionic reagent, and the acid treated single float product is subjected to cationic floatation with cationic reagent to produce a double float product, wherein the improvement comprises:

(a) performing said cationic floatation in first and second stages;

(b) adding cationic floatation reagent in starvation amounts in said first stage with a low floatation retention time to produce a float containing most of the silica from the ore which is discarded; and,

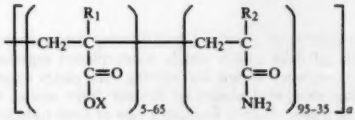
(c) adding additional cationic floatation reagent to the phosphate ore remaining from said first stage to said second stage with enough floatation retention time to produce a float containing most of the phosphate from the total cationic floatation tailings which is recovered.

4,289,613
LOW MOLECULAR WEIGHT HYDROLYZED POLYMERS OR COPOLYMERS AS DEPRESSANTS IN MINERAL ORE FLOTATION

Richard M. Goodman, Norwalk, and Sim K. Lim, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 19, 1979, Ser. No. 95,812
Int. Cl.³ B03D *1/06*
U.S. Cl. 209—167 **13 Claims**

1. A process for depressing oxidic iron minerals in a flotation system which comprises adding to the flotation system, as a selective depressant, an effective amount of a copolymer or water soluble salt thereof of the general structure:

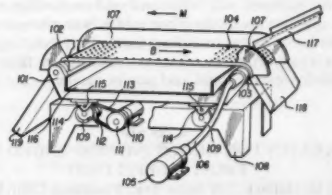


wherein R_1 and R_2 are individually hydrogen or a methyl radical, X is a hydrogen, alkali metal or ammonium ion and a has a numerical value such that the total molecular weight of the copolymer is within the range from about 200 to 85,000.

4,289,614
SPROUTING BEANS REFINEMENT APPARATUS

Tomosaburo Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Daisei Kikai, Tokyo, Japan

Filed Dec. 12, 1979, Ser. No. 102,914
Claims priority, application Japan, Mar. 6, 1979, 54-25752; Mar. 6, 1979, 54-25753
Int. Cl.³ B07B *1/10*
U.S. Cl. 209—308 **5 Claims**



1. A sprouting bean refinement apparatus comprising:

a vibration frame including a perforated screen, said perforated screen comprising a perforated endless belt and further comprising a driving device for driving the endless belt in one direction and cleaning means arranged so as to face said endless belt and statically placed so as to remove deposits on the endless belt;

a vibrator operatively associated with said vibrator frame for generating vibration in a direction having a component opposite said one direction to said vibration frame; and

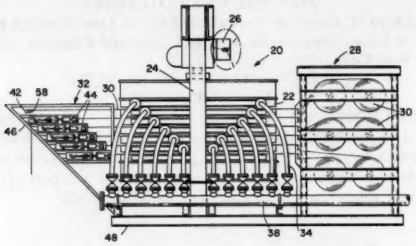
said cleaning means contacting said perforated screen such that relative sliding motion is generated between the cleaning means and the perforated screen to thereby remove deposits on the top side of the perforated screen.

4,289,615

FILTER MEDIA MOVER FOR PLATE TYPE FILTER

John R. Schneider, Belvedere, and Joseph F. Mangione, San Rafael, both of Calif., assignors to Russ Schneider & Associates, Tiburon, Calif.

Filed Jan. 18, 1980, Ser. No. 113,187
Int. Cl.[3] B01D *29/02*
U.S. Cl. 210—91 **11 Claims**



1. In combination with a liquid filtering device comprising a plurality of filter plates which, when placed together, form liquid containers, means for moving said plates together for retaining elongated sheets of flexible filter media between adjacent plates, thereby forming a pair of fluid-tight chambers on opposite sides of each sheet, there being an inlet to one chamber and an outlet to the opposite chamber on the other side of the sheet, and means for separating the plates when the sheets of filter media are contaminated, a sheet extraction and advancing means for the various sheets of filter media adjacent the filtering device comprising:

a frame;

an elongated drive roller for each sheet of filter media supported by said frame and extending generally perpendicular to the longitudinal center line of the media, each said drive roller being a crown roll with a slightly greater diameter at its midpoint than at its ends;

controllable power means for rotating each said drive roller;

a freely rotatable bar adjacent each said drive roller and a plurality of rotatable pinch wheels mounted on said bar;

means for urging each said bar towards its adjacent roller when said power means is activated so that said pinch wheels will press against the filter media which is partially wrapped around said roller, thereby causing a frictional force between said roller and said media that is sufficient to advance the media when said power means is activated, said latter means including means for retracting each said bar away from its adjacent roller when filter media is initially installed and said power means is deactivated.

4,289,616

APPARATUS FOR REMOVING SUSPENDED SOLIDS FROM AN EFFLUENT

Richard D. Hallack, 329 Anita Ave., Pasadena, Calif. 91105, and Tommie B. Carter, 806 Valencia Mesa Dr., Fullerton, Calif. 92632

Continuation-in-part of Ser. No. 777,687, Jun. 25, 1977, abandoned, and Ser. No. 924,373, Jul. 13, 1978, Pat. No. 4,203,836. This application May 19, 1980, Ser. No. 150,913
Int. Cl.[3] B01D *33/32*
U.S. Cl. 210—101 **10 Claims**

1. Apparatus for separating suspended solids from a liquid containing such suspended solids, the apparatus comprising:

(a) a base;

(b) a pan supported on the base having a bottom wall, a spaced-apart pair of sidewalls extending upwardly and outwardly from the bottom wall, and a spaced-apart pair of end walls extending upwardly and outwardly between the sidewalls and from the bottom wall to form an open-top container;

(c) a perforated plate within the pan and secured to the sidewalls and end walls of the pan above the bottom wall to define a chamber between the bottom wall, an undersurface of the perforated plate, and the surrounding side and end walls;

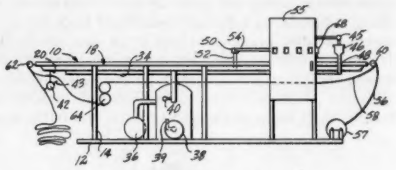
(d) at least one outlet on the bottom wall of the pan for introducing a vacuum to the chamber and for removing liquid from the pan;

(e) a continuous liquid-absorbing medium transfer support lying within the pan in contact with the perforated plate and extending across the end walls and forming a loop around the pan;

(f) roller means for providing ease of movement of the transfer support around the pan;

(g) drive means for moving the transfer support around the pan;

(h) a liquid-absorbing medium comprising an industrial paper toweling having a basis weight from about 28 to



about 34 pounds per ream, a caliper from about 0.013 to about 0.0145, an aged-wet tensile strength from about 16 to 25 ounces and an aged absorption of less than 40 seconds, positioned on the transfer support on the pan;

(i) means for introducing liquid containing suspended solids to the pan onto the liquid-absorbing medium;

(k) means for sensing the level of liquid containing suspended solids in the pan and for activating the means for introducing liquid containing suspended solids to the pan when the level is below a selected level;

(l) a liquid receiver spaced from the pan and connected to an outlet of the pan by a conduit for removing liquid from the pan to the liquid receiver;

(m) a vacuum pump connected by a vacuum line to the liquid receiver for creating a reduced pressure in the liquid receiver and in the chamber in the pan; and

(n) a liquid transfer pump connected to the liquid receiver for removing liquid from the liquid receiver.

4,289,617

WATER SOFTENING AND REVERSE OSMOSIS SYSTEM

Stephen H. Davis, Dayton, Ohio, assignor to Water Refining Company, Inc., Middletown, Ohio

Filed May 5, 1980, Ser. No. 146,956
Int. Cl.[3] B01D *57/00*
U.S. Cl. 210—109 **18 Claims**

11. A water softening and reverse osmosis treatment system comprising:

a pressure tank;

a closure for the pressure tank having an access opening therethrough;

an inlet line for conveying raw water to the pressure tank;

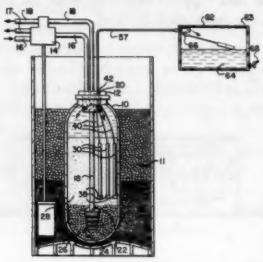
an outlet line for conveying softened water from the tank;

a treatment material held within the pressure tank;

a plurality of tubular membrane elements embedded within the treatment material, each membrane element including a perforated membrane carrier having a hollow core and a semi-permeable reverse osmosis membrane covering the external surface of the membrane carrier, each membrane element having a diameter less than the diameter of the access opening;

a plug sealing the access opening and having an upper recess and a plurality of passages communicating with the recess;

a plurality of flexible tubes, each communicating with a hollow core and extending to a passage so that water may pass from the membrane carrier to the plug;



a holding tank; and

a water line attached to an end to the recess of the plug and at an opposite end to the holding tank.

4,289,618

MOTION CONTROL FOR A FILTER PRESS

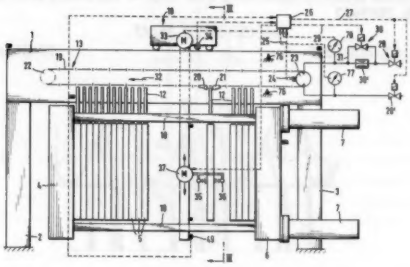
Alfons Schotten, Düren; Herman J. Spölgen, Langerwehe, and Ulrich Rilling, Düren, all of Fed. Rep. of Germany, assignors to Eberhard Hoesch & Söhne GmbH & Co., Düren, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,028

Claims priority, application Fed. Rep. of Germany, May 30, 1978, 2823501

Int. Cl.³ B01D *25/12*

U.S. Cl. 210—142 **10 Claims**



1. In a plate filter press having a length dimension and including a guide carrier extending in said length dimension; a plurality of filter plated oriented perpendicularly to said length dimension and being shiftably supported on the guide carrier for displacement towards a closed side and an opposite, open side of the filter plate press; a filter plate shifting apparatus for individually displacing the filter plates of a filter plate stack on the closed side towards the open side; the filter plate shifting apparatus having a drive motor, a traveling carrier element connected to the drive motor and filter plate engaging elements mounted on the traveling carrier element for being displaced by the drive motor back and forth in a clearance between the closed side and the open side of the plate filter press; the improvement comprising

(a) a displacement sensor for emitting signals in response to the motion of said filter plate engaging elements in said length dimension; and

(b) a monitoring and control means operatively connected to said displacement sensor for receiving said signals to monitor the momentary position of the successive traveling paths of said filter plate engaging elements with respect to said guide carrier to determine the required displacement characteristics for each filter plate as a function of the determined position; said monitoring and control means being further operatively connected to said drive motor for controlling the motion of said filter plate engaging elements for controlling the shifting motion of the individual filter plates as a function of said displacement characteristics.

4,289,619

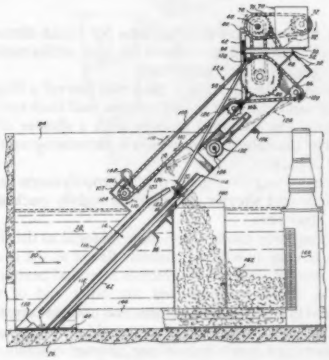
MATERIAL HANDLING APPARATUS

Milo J. Sampson, 1713 Douglas, Ames, Iowa 50010

Filed Aug. 11, 1980, Ser. No. 177,199

Int. Cl.³ B01D *35/16*

U.S. Cl. 210—159 **11 Claims**



1. In a screening apparatus adapted to be disposed in a refuse laden waterstream to collect debris therein and a rake disposed for reciprocal movement relative thereto to remove collected debris, the combination therewith of:

an elongated frame defining respective upper and lower end portions,

said screening apparatus mounted on said lower end portion,

respective lower and upper parallel tracks extending longitudinally of said frame at said lower end portion,

said rake adapted to slidably ride on said lower track in engagement with said screening apparatus in an upwardly cleaning stroke and to slidably ride on said upper track out of engagement with said screening apparatus on a downwardly return stroke,

a power driven endless chan operably mounted on said frame at said upper end portion to move in respective directions towards and away from said screening apparatus,

an elongated rod pivotally connected at one end to said chain for movement therewith in its path of travel and secured at its other end to said rake,

fulcrum means on said frame in said upper end portion in the line of travel of said rod,

movement of said chain away from said screening apparatus acting through said rod to slide said rake on said lower track in its cleaning stroke, and

movement of said chain in reversing its direction towards said screening apparatus effecting the engagement of said rod with said fulcrum means and the resulting upwardly tilting of said rod and said rake to a position where further movement of said chain towards said screening apparatus acts to move said rake on said upper track on its return stroke.

4,289,620

HIGH PRESSURE GLASS COLUMN FOR HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

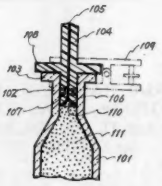
Shoji Hara, 1618, Shiki, Shiki-shi, Saitama, Japan

Filed Nov. 9, 1979, Ser. No. 92,980

Claims priority, application Japan, Nov. 22, 1978, 53-143338

Int. Cl.³ C02F *1/68;* G01N *31/06*

U.S. Cl. 210—198.2 **5 Claims**



1. In a high pressure glass column for liquid chromatography, a high pressure glass column for high performance liquid chromatography which comprises:

(a) a glass column having at each end thereof a flange made of the same material as said column, said each end communicating via a conical passage with a shorter column of smaller diameter and in which a chromatographic absorbent is packed;

(b) a distributing filter made of a fluoropolymeric resin fitted in each said shorter column and tightly packed against said absorbent;

(c) a fitting plug made of the same material as the filter, said plug having an external annular flange at the center portion thereof, one end of which is extended beyond the end of the shorter column and the other end of which is packed into the shorter column and contacts one said filter so that the outer face of each said fitting plug tightly contacts the inner face of the shorter column, wherein each said plug includes a small diameter axial bore and the outlet thereof is formed in a bowl-like shape, and a plurality of hollows are circumferentially formed in the plug above the bowl so that the mouth of the bowl may be enlarged to compress against the inside of the column tube and the hollows may be shrunk by the enlargement of the bowl; and

(d) a clip fitting and holding the two flanges of the main column and the plug.

4,289,621

DEVICE FOR TREATING FLUIDS WITH MAGNETIC LINES OF FORCE

James R. O'Meara, Jr., 2023 S. Gessner, Ste. N-2, Houston, Tex. 77063

Filed May 21, 1980, Ser. No. 151,864

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—222 **11 Claims**

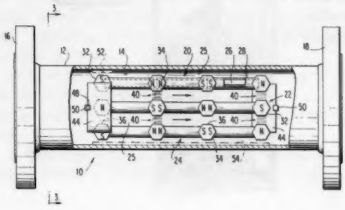
1. A device for the treatment of fluids with magnetic lines of force comprising:

an elongated hollow non-ferromagnetic outer casing having a longitudinal axis and fluid inlet and outlet means at the longitudinal ends thereof;

at least three spaced-apart and longitudinally coextensive elongated magnet assemblies, each positioned within said outer casing and having a longitudinal axis substantially parallel with that of adjacent magnet assemblies and with the longitudinal axis of said outer casing to form elongated laminar passageways for said fluid therebetween;

each of said magnet assemblies comprising at least one tier of at least two permanent magnets, each magnet being encased in a non-ferromagnetic jacket and arranged in a coaxial line with the other magnet or magnets in the same tier with like poles of said magnets adjacent each other;

said non-ferromagnetic jacket having its ends supported by ferromagnetic support members and the length of each tier of jacketed magnets being supported between its ends by at least one ferromagnetic support member adjacent the ends of the jacketed magnets received therein, to magnetize said support members with the polarity of the magnet ends supported thereby;



said magnet assemblies being positioned so that the polarities of the support members in one of said magnet assemblies are unlike the polarities of the oppositely disposed support members in an adjacent magnet assembly; and

means for fixedly positioning said magnet assemblies within said outer casing.

4,289,622

PLATE FILTER PRESS WITH FILTER CLOTH TRANSPORT

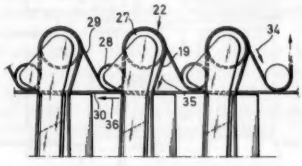
Alfons Schotten, Düren, Fed. Rep. of Germany, assignor to Eberhard Hoesch & Söhne GmbH & Co., Düren, Fed. Rep. of Germany

Filed Dec. 13, 1979, Ser. No. 103,218

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 2853952

Int. Cl.³ B01D *25/32*

U.S. Cl. 210—225 **13 Claims**



1. In a filter press including a press stand having a length dimension; a plurality of plate-like filter elements and frame-like filter elements oriented perpendicularly to said length dimension and arranged alternatingly and supported in said stand for displacement parallel to said length dimension and relative to one another; a closing device operatively connected to the filter elements for pressing the filter elements to one another into a filter element stack; a guide roller supported on each filter element alternatingly at opposite sides thereof as viewed in said length dimension; each said guide roller having a horizontal axis of rotation oriented perpendicularly to said length dimension; a continuous filter cloth trained about each said guide roller for guiding said filter cloth in a zigzag course between all adjoining filter elements; at least some of said guide roller being driven guide rollers rotated by driving means for pulling said filter cloth through said filter elements in said zigzag course; the improvement in said driving means comprising

(a) a sprocket drivingly connected with each said driven guide roller and having a rotary axis in alignment with the rotary axis of the respective driven guide roller;

(b) a guide wheel mounted on each filter element which

supports a driven guide roller; each guide wheel having a rotary axis extending parallel with the rotary axis of the respective sprocket and spaced therefrom in a direction which forms an angle other than zero with the direction of said length dimension;

(c) an endless flexible drive member meshing in succession with each said sprocket and being deflected by respective said guide wheels between every adjoining sprocket, whereby said flexible drive member has a zigzag course and is trained about each said sprocket in the same direction; and

(d) motor means for driving said flexible drive member to unidirectionally rotate said guide rollers.

4,289,623

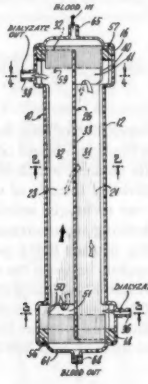
HOLLOW FIBER DIALYSIS

Kyu H. Lee, King of Prussia, Pa., assignor to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Continuation of Ser. No. 629,082, Nov. 5, 1975, abandoned. This application Oct. 19, 1977, Ser. No. 843,502

Int. Cl.[3] B01D *31/00*

U.S. Cl. 210—247 **22 Claims**



1. A hollow fiber dialyzer having an elongated tubular casing containing partitioning that divides its interior into a plurality of separate longitudinally-extending passageways, dialyzate flow directing means for receiving dialyzate from an external source and directing it to flow from one casing end to the other through one of the passageways and then back to said one casing end through another of the passageways and so to and fro lengthwise through the other passageways and finally out of the casing, at least two of the passageways each having a longitudinally-extending bundle of elongated hollow blood dialysis fibers extending lengthwise through it, and means connected to deliver blood to be dialyzed from an inlet to the fiber ends of each of such bundles at the same end of the casing and to receive the blood from the other ends of the hollow fibers for delivery to an outlet, characterized in that only some but not all of the passageways have said bundles of fibers and the remaining passageways do not contain dialysis fibers, and the dialyzate flow directing means directs dialyzate to flow from one casing end to the other in alternating fashion through the passageways having bundles of fibers and the passageways which do not contain fibers so that the dialyzate flow through each of the passageways having bundles of fibers is always in the same lengthwise direction.

4,289,624

APPARATUS FOR EXTRACTING SOLIDS FROM SLURRY

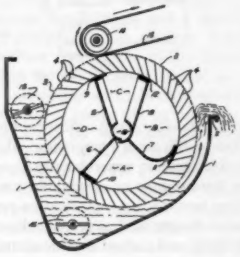
Roman Golczewski, 19 Primrose Ave., Ryde 2112, N.S.W.; Barry G. Seach, 92 Cecil Ave., Castle Hill, 2154, and Solomon E. Cohen, 46A Epping Ave., Eastwood, N.S.W., all of Australia

Filed Mar. 14, 1979, Ser. No. 20,534

Claims priority, application Australia, Mar. 20, 1978, 3757

Int. Cl.[3] B01D *33/06*

U.S. Cl. 210—404 **22 Claims**



1. An apparatus for separating solids from a slurry suspension of solids and liquid, including a container adapted to hold a quantity of the slurry suspension, said apparatus comprising:

a cylindrical sieve rotatably mounted to said container, said sieve being adapted to permit passage therethrough of the liquid while substantially retaining the solids on a surface thereof while being partially immersed in the slurry;

means within said cylindrical sieve defining a stationary first reduced pressure chamber within said cylindrical sieve for applying suction to a zone on the interior side of said sieve, said interior zone being at least partially within that part of the circumference of said sieve most deeply immersed in the slurry;

means for feeding said slurry suspension to a corresponding zone on the exterior side of said sieve, whereby the solids are urged against said corresponding zone of said sieve and the liquid is urged to flow through said sieve to the interior thereof;

means within said cylindrical sieve defining a second chamber angularly spaced from said first chamber, said second chamber defining means being at least partially formed as a trough;

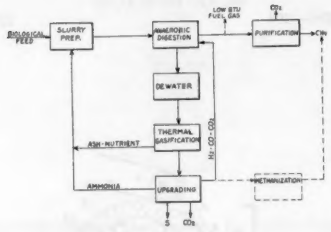
conveyance means comprising a plurality of liquid collection and transport means spaced around the circumference of said sieve and extending generally inwardly from the inner surface of said sieve, said liquid collection and transport means being arranged to collect some of the liquid when said liquid collection and transport means are adjacent said interior zone and being arranged to discharge at least some of the thus collected liquid onto said trough when said liquid collection and transport means are moved toward said second chamber to a position removed from adjacent said interior zone;

sealing means whereby reduced pressure may be substantially maintained in said first reduced chamber notwithstanding transportation of liquid therefrom by said liquid collection and transport means.

4,289,625
HYBRID BIO-THERMAL GASIFICATION

Paul B. Tarman, Elmhurst, and David P. Chynoweth, St. Charles, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Jan. 18, 1980, Ser. No. 113,242
Int. Cl.³ C02F *3/28*
U.S. Cl. 210—603 **28 Claims**

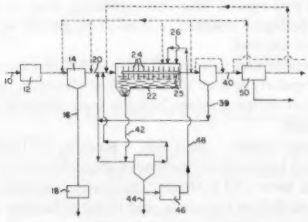


1. A hybrid bio-thermal gasification process for improved carbonaceous gasification comprising: adding biological feed to an anaerobic digester; anaerobically digesting said biological feed under thermophilic or mesophilic conditions in an active liquid culture; introducing a gasification product to said active liquid culture during said anaerobic digesting; withdrawing product methane and carbon dioxide containing gas from said digester; separately withdrawing biological residue from said digester and introducing it into a thermal gasifier; gasifying at least a substantial portion of said biological residue under elevated temperature conditions producing thermal gasifier products and thermal residue, at least a portion of said thermal gasifier products or their derivatives being passed through said digester as said gasification product.

4,289,626
WASTEWATER TREATMENT

Paul V. Knopp, Wausau, and Walter Burant, Jr., Weston, both of Wis., assignors to Sterling Drug, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 937,963, Aug. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 834,231, Sep. 19, 1977, abandoned. This application Mar. 7, 1980, Ser. No. 128,273
Int. Cl.³ C02F *1/28, 3/08*
U.S. Cl. 210—616 **6 Claims**



6. A process for treating wastewater comprising the following steps:

a. contacting wastewater in a stream in a biological contactor apparatus which has a multiplicity of surfaces therein alternately immersed in the stream and air above the stream, for a period of time of at least ½ hour while adding to the stream an adsorbent capable of adsorbing impurities from the wastewater, and

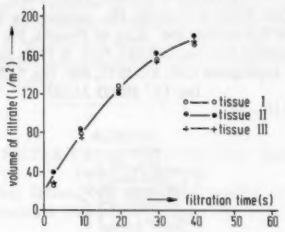
b. removing accumulated suspended solids from the contactor apparatus at a rate substantially equivalent to the rate at which solids accumulate within the contactor,

wherein the adsorbent is added at the downstream end of the biological contactor apparatus and is moved by the surfaces in the contactor apparatus in countercurrent relationship with the bulk of the liquid flow.

4,289,627
LIQUID FILTRATION PROCESS

Dieter Disselbeck, Bad Soden am Taunus; Gerhard Neumann, Frankfurt am Main; Karl-Heinz Ott, Kelkheim; Günther Strobel, and Edwin Zalewski, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 30, 1979, Ser. No. 71,296
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901397
Int. Cl.³ B01D *39/08*
U.S. Cl. 210—702 **4 Claims**



1. A method for the separation of solid material from a liquid phase which comprises pouring a liquid containing solids into a three-dimensional filter element which consists of a fabric of synthetic fibers the individual threads of which are bound to each other by at least one technique selected from the group consisting of crossing, knitting and overcasting so in an unshiftable manner without the threads being permanently bonded together at the contact points between the warp and weft, said fabric having an air permeability of more than 50 l/dm².min at a pressure difference of 2 millibar and resistant to a permanent load over the entire filter area without formation of free regions; passing the liquid through said fabric and thus filtering off the solids content.

4,289,628
PROCESS FOR SEPARATING SOLIDS FROM LIQUID MATTER

Dieter Disselbeck, Bad Soden am Taunus, and Rudolf Richter, Hünstetten, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 28, 1980, Ser. No. 154,068
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1979, 2922778
Int. Cl.³ B01D *23/04*
U.S. Cl. 210—703 **9 Claims**

1. A process for separating solids from liquid matter by gravity comprising feeding a gas into a liquid medium from which solid particles are to be separated whereby gas bubbles accummulate on the solid particles, introducing the liquid medium into a three dimensional filter element to form a column of the liquid medium in the filter element whereby the gas bubble-particles float to the upper level of the said column to form a layer of particles on the upper surface of the column and allowing the liquid matter to pass through the sides and bottom of the filter element while continuously building alluvial filter layers of the solids on the internal surface of the filter

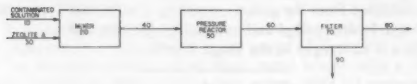
element from the bottom upwards along the filter wall relative to the rising level of the liquid medium in the filter element.

4,289,629

REMOVAL OF CONTAMINANTS FROM STRONGLY ALKALINE SOLUTION

Claude R. Andrews, Pasadena, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Jul. 10, 1980, Ser. No. 168,833
Int. Cl.³ C01B *33/26, 33/28*
U.S. Cl. 210—737 **2 Claims**



1. A method of removing chloride and carbonate ions from a strongly alkaline solution comprising:

(a) mixing sodium aluminosilicate with said solution wherein said sodium aluminosilicate is selected from the group consisting of zeolite A and hydroxysodalite wherein said sodium aluminosilicate constitutes at least 20% by weight of the solution;

(b) heating the resulting solution to a temperature of at least 90 degrees Celsius to produce a sodalite type product; and,

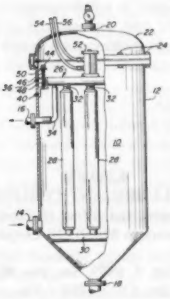
(c) filtering said sodalite type product from the solution.

4,289,630

FILTER CAKE REMOVAL METHOD AND APPARATUS

Henry Schmidt, Jr., Hinsdale; Allen E. Cederholm, Western Springs, and James F. Zievers, LaGrange, all of Ill., assignors to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Dec. 10, 1979, Ser. No. 102,258
Int. Cl.³ B01D *29/38*
U.S. Cl. 210—785 **15 Claims**



1. A filter, comprising in combination

a filter tank enclosing a filter chamber,

a liquid inlet opening into said tank through which a filtrate may be introduced into said chamber,

a rigid, generally planar tubular header manifold having a passageway therein,

spring means supporting said manifold in said chamber,

an effluent outlet from said tank,

conduit means connecting said passageway to said outlet, a plurality of filter elements each having a perforate filter media overlying an internal cavity therein,

said filter elements being fixedly mounted at one end to said header with said cavities being in communication with said passageway,

said filter elements being in mutually parallel relationship, the outer surfaces of said filter media extending in a direction perpendicular to the plane of said header manifold and

vibratory impactor means connected to said manifold for impacting said manifold in a direction parallel to the outer surface of said filter media.

4,289,631

COMPOSITIONS AND PROCESS FOR EXTENSION OF THE USEFUL LIFE OF MACHINE ELEMENTS

S. Roy Luxemburg, 680 Sharp La., Baton Rouge, La. 70815

Continuation-in-part of Ser. No. 772,547, Feb. 28, 1977, abandoned. This application Dec. 16, 1977, Ser. No. 861,126
Int. Cl.³ C09K *7/00*
U.S. Cl. 252—8.5 B **10 Claims**

1. A novel composition of matter useful for metal plating the metal surfaces of a machine element to increase its useful life which comprises a carrier material admixed with reactants comprised of an electron donor metal and a decomposable plating-metal bearing compound, the electron donor metal being more electropositive and higher in the electromotive series of the metals than the metal constituent of said decomposable plating-metal compound which is electronegative and consequently capable of being plated out by the more electropositive metal of said series on said metal surfaces of said machine element, one or both of which reactants is encapsulated within a film of material to form a barrier between said electron donor metal and said decomposable plating-metal bearing compound to prevent the release and contact of one reactant with the other but which, at conditions of operation of said machine element, the film of material will be caused to break-down and release the reactants from contact and reaction one with the other to deposit the plating-metal of said decomposable plating-metal bearing compound on the metal surfaces of said machine element to extend its wear capabilities and useful life.

4,289,632

LOST CIRCULATION MATERIAL FOR SEALING PERMEABLE FORMATIONS

Elmer E. Clear, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 20, 1979, Ser. No. 77,215
Int. Cl.³ C09K *7/02, 7/06*
U.S. Cl. 252—8.5 LC **10 Claims**

1. A composition of matter for sealing permeable formations comprising diatomaceous earth and a suspending agent wherein:

the suspending agent consisting of finely divided paper present in an amount in the range of about 2 to about 30 percent by weight of said mixture said diatomaceous earth being present in an amount of from about 70 to about 98 percent by weight of said mixture.

4,289,633

CHEMICAL PROCESS FOR BACKSURGING FLUID THROUGH WELL CASING PERFORATIONS

Edwin A. Richardson, Houston; Ronald F. Scheuerman, Bellaire, and David C. Berkshire, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 28,025, Apr. 6, 1979, Pat. No. 4,219,083. This application Dec. 20, 1979, Ser. No. 105,815
Int. Cl.³ E21B *43/25*
U.S. Cl. 252—8.55 B **3 Claims**

1. An additive that dissolves in an aqueous liquid to form a solution capable of treating a well within a subterranean reservoir by chemically generating a pulse of fluid pressure and heat within a near-well portion of the reservoir, comprising:

at least one water-soluble salt of ammonium hydroxide capable of being oxidized within an acidic aqueous solution to yield nitrogen gas and liquid or dissolved by-products which are substantially inert to the components of said well and reservoir;

at least one water-soluble salt of nitrous acid that is an oxidizing agent capable of so-oxidizing salt of ammonium hydroxide and is present in at least a substantially stoichiometric proportion for said nitrogen gas production from said salt of ammonium hydroxide.

at least one water-soluble alkaline buffer system which is capable of maintaining an aqueous solution containing said nitrogen-containing compound and said oxidizing agent at a pH of at least 7 at which the rate of said gas-generating reaction is relatively slow throughout a period in which a significant proportion of hydrogen ions are being released within the solution; and,

at least one water-soluble compound which is (a) capable of being dissolved in an aqueous solution containing said salts of ammonium hydroxide and nitrous acid and alkaline buffer and there reacting to yield enough hydrogen ions to subsequently reduce the pH of the solution to a pH less than about 7 at which the rate of said gas-generating reaction is relatively fast, (b) is capable of causing said pH reduction to occur after a time sufficient to permit a significant volume of the solution to be injected through the said well and into the surrounding reservoir and (c) is a member of the group consisting of lower alcohol esters of lower fatty acids, hydrolyzable acyl halides, relatively slowly hydrolyzable acid anhydrides and relatively slowly hydrolyzable phosphoric or sulfonic acid esters.

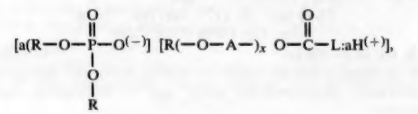
4,289,634

DEPOSIT CONTROL ADDITIVES AND FUEL AND LUBE OIL COMPOSITIONS CONTAINING THEM

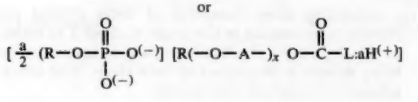
Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 25, 1979, Ser. No. 60,307
Int. Cl.³ C10M *1/46, 1/32, 3/40;* **C10L** *1/26*
U.S. Cl. 252—32.5 **11 Claims**

2. An additive composition effective as a minor component in a fuel or lubricating oil composition for reducing the deposition of solids and inhibiting corrosion in the intake system and crankcase of an internal combustion engine, said additive composition comprising at least one salt of the formula



or

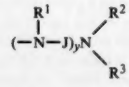


wherein:

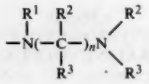
(1) said R groups are the same or different hydrocarbyl groups having a carbon atom content in the range from 1 to 30 selected from the group consisting of phenyl, mono-, di- and trialkylphenyl, alkyl, cycloalkyl, alkenyl, cycloalkenyl, and combinations thereof;

(2) A is an alkylene group having a carbon atom content in the range of from 2 to 5 and x is an integer sufficient to provide said cation in unprotonated form with a molecular weight in the range of from about 500 to 10,000;

(3) L is monovalent and selected from the group consisting of radicals of the formula


(i)

wherein J is an alkylene group having a carbon atom content in the range 2 to 6 and y is an integer in the range 1 to 11, and



wherein n is an integer in the range 2 to 6;

(4) R^1, R^2 and R^3 are the same or different groups having a carbon atom content in the range 0 to 16 selected from the group consisting of hydrogen and hydrocarbyl groups selected from the group consisting of acyl, alkoxy, ketoalkyl, hydroxyalkyl and cyanoalkyl groups; and

(5) a is an integer in the range 1 to 3.

4,289,635

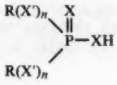
PROCESS FOR PREPARING MOLYBDENUM-CONTAINING COMPOSITIONS USEFUL FOR IMPROVED FUEL ECONOMY OF INTERNAL COMBUSTION ENGINES

Calvin W. Schroeck, Eastlake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Feb. 1, 1980, Ser. No. 117,892
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E **82 Claims**

1. A process for preparing a composition which comprises reacting an olefinically unsaturated compound capable of reacting with active sulfur with a composition prepared by a process which comprises reacting:

(a) A phosphorus-containing acid represented by the formula:



wherein each X and X' is independently oxygen or sulfur, each n is zero or one, and each R is independently the same or a different hydrocarbon-based radical;

(b) at least one hexavalent molybdenum oxide compound, and

(c) hydrogen sulfide,

in the presence of (d) a polar solvent.

4,289,636

AQUEOUS LUBRICANT COMPOSITIONS

Robert H. Davis, Pitman, and Alfred B. Piotrowski, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,713
Int. Cl.³ C10M *1/06*
U.S. Cl. 252—49.3 **11 Claims**

1. An improved water-soluble lubricant comprising an effective anti-corrosion or anti-rust amount of a water-soluble amide derived from the reaction of a C_1–C_{30} primary alkyl amine or a C_1–C_{30} secondary alkyl amine with a member selected from the group consisting of tetrahydrophthalic acid, tetrahydrofuran tetracarboxylic acid, tetrahydrophthalic acid anhydride and tetrahydrofuran tetracarboxylic acid anhydride and water to make the balance of the composition.

7. A water-soluble lubricant composition comprising about 5–40 wt. % of a water-soluble amide derived from the reaction of a C_1–C_{30} primary or secondary alkyl amine and a member selected from the group consisting of tetrahydrophthalic acid tetrahydrofuran tetracarboxylic acid tetrahydrophthalic acid anhydride and tetrahydrofuran tetracarboxylic acid anhydride, 5–50 wt. % of a water-soluble mono-, di- or tri-alkanolamine, about 0.5 to 20 wt. % of a water-soluble polyoxyalkylene

glycol containing at least one homopolyalkylene unit having a unit weight of at least about 800 and water to make the balance of the composition.

4,289,637

MINERAL OIL SOLUBLE BORATE COMPOSITIONS

Joseph Dulat, Fetcham, England, assignor to United States Borax & Chemical Corp., Los Angeles, Calif.

Filed Nov. 29, 1979, Ser. No. 98,455

Claims priority, application United Kingdom, Jan. 15, 1980, 47564/78

Int. Cl.³ C10M *1/06*

U.S. Cl. 252—49.5 **11 Claims**

1. A stable, mineral oil-soluble borate composition formed by reacting at a temperature in the range of about 50° to 120° C. an aqueous solution of an alkali metal borate with a fatty acid containing about 8–22 carbon atoms, fatty oil containing said fatty acid, or mixture thereof in the presence of about 1 to 10% of a surfactant selected from lanolin, ethylene glycol monostearate, and mixtures hereof, said composition containing about 5–30% of said alkali metal borate.

4. A method for the preparation of an alkali metal borate reaction product which is soluble in mineral oil which comprises reacting an aqueous solution of an alkali metal borate with a fatty acid containing about 8–22 carbon atoms, a fatty oil containing said fatty acid, or a mixture thereof, at an elevated temperature in the range of about 50°–120° C. in the presence of about 1 to 10% of a surfactant selected from lanolin, ethylene glycol monostearate, and mixtures thereof, said reaction product containing about 5 to 30% w/v of said alkali metal borate.

11. Mineral oil containing the borate composition of claim **1** dissolved therein, said mineral oil containing at least one surfactant having an intermediate to high HLB value and containing about 1 to 10% w/v of alkali metal borate.

4,289,638

METAL TREATMENT

Bruce E. Svenson, 852a Pittwater Rd., Dee Why, N.S.W., Australia (2099)

Filed Sep. 28, 1979, Ser. No. 80,794

Claims priority, application Australia,

Int. Cl.³ C09G *1/02;* **C11D** *7/08, 7/20, 7/46*

U.S. Cl. 252—85 **3 Claims**

1. A rust treatment preparation comprising:

from about 5% to about 35% V/V of about 95% concentrated phosphoric acid,

from about 25% to about 35% W/V of an emulsifier selected from the group consisting of anhydrous wool fat, anhydrous wool grease, hydrous wool fat, hydrous wool grease and derivatives thereof,

from about 10% to about 15% W/V of a stabilizer-absorbing agent; and

a solvent selected from the group consisting of methylated and industrial spirits.

2. A rust treatment preparation as described in claim **1** further comprising:

about 33⅓% V/V of said concentrated phosphoric acid, wherein said emulsifier comprises about 25% W/V commercial wool grease and said stabilizer-absorbing agent comprises about 10% W/V of kaolin.

4,289,639

METHOD AND COMPOSITION FOR REMOVING SULFIDE-CONTAINING SCALE FROM METAL SURFACES

Gary R. Buske, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 3, 1980, Ser. No. 193,878

Int. Cl.³ C02B *5/06;* **C11D** *7/10, 7/26;* **C23G** *1/06*

U.S. Cl. 252—87 **9 Claims**

1. An aqueous acid composition comprising an aqueous non-oxidizing acid having glyoxlic acid dissolved therein; said composition having, as one of its chemical properties, the capability of dissolving acid-soluble, sulfide-containing scale from a metal surface without the evolution of hydrogen sulfide gas.

7. In the method of chemically cleaning acid-soluble, sulfide-containing scale from a metal surface comprising contacting said scale with an aqueous acid cleaning composition comprising an aqueous non-oxidizing acid having at least one aldehyde dissolved or dispersed therein, which aldehyde is present in an amount at least sufficient to prevent or substantially prevent the evolution of hydrogen sulfide gas the improvement comprising using glyoxlic acid as said aldehyde.

4,289,640

CLEANING COMPOSITIONS

Pasquale J. Falivene, Union City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 21, 1974, Ser. No. 434,853

The portion of the term of this patent subsequent to Aug. 15, 1996, has been disclaimed.

Int. Cl.³ C11D *3/065, 3/14, 7/12, 7/54*

U.S. Cl. 252—95 **11 Claims**

1. A dry powder cleaning composition comprising a particulate base selected from the group consisting of an abrasive and a detergent builder salt and mixtures thereof; a synthetic organic detergent; and an organic hydrotrope, with the proportion of hydrotrope to detergent being in the range of about 0.4 to 5, on a molar basis, at least about 8% by weight of any such abrasive particles having a diameter of at least about 0.037 mm.

4,289,641

DETERGENT PRODUCT

David C. Hooper, Ashford; George A. Johnson, and Donald Peter, both of Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 15, 1978, Ser. No. 933,931

Claims priority, application United Kingdom, Jan. 12, 1978, 1285/78

Int. Cl.³ C11D *9/44, 9/50*

U.S. Cl. 252—96 **14 Claims**

1. A deodorant detergent product comprising:

(i) from 1 to 99% by weight of a soap;

(ii) from 0.99 to 98.99% by weight of other detergent adjuncts including at least one selected from the group consisting of detergency builders (other than soap) and bleaches; and

(iii) from 0.01 to 10% by weight of a deodorant composition comprising from 45 to 100% by weight of deodorant active components, said components having a lipoxidase-inhibiting capacity of at least 50% or a Raoult variance ratio of at least 1.1, said components being classified into six classes consisting of:

Class 1: phenolic substances

Class 2: essential oils, extracts, resins and synthetic oils

Class 3: aldehydes and ketones

Class 4: polycyclic compounds

Class 5: esters

Class 6: alcohols,

provided that where a component can be classified into more than one class, it is placed in the lower or lowest numbered class;

said components being so selected that

(a) the deodorant composition contains at least five components of which at least one must be selected from each of Class 1, Class 2 and Class 4;

(b) the deodorant composition contains components from at least 4 of the 6 classes; and

(c) any component present in the deodorant composition at a concentration of less than 0.5% by weight of said composition is eliminated from the requirements of (a) and (b)

said deodorant composition having a deodorant value of from 0.50 to 3.5 as measured by the Deodorant Value Test.

4,289,642

DETERGENT COMPOSITION HAVING A SIZING EFFECT COMPRISING NONIONIC AND/OR ZWITTERIONIC TENSIDES AND POLYSACCHARIDE AMINO ESTERS

Rudolf Weber, Düsseldorf, and Hans Andree, Leichlingen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Feb. 29, 1980, Ser. No. 126,037

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1979, 2911857

Int. Cl.³ C11D *3/22*

U.S. Cl. 252—99 **15 Claims**

15. A detergent composition with a sizing effect which consists essentially of:

(a) from about 1 to 30 percent by weight of nonionic and/or zwitterionic tenside;

(b) from about 0.5 to 10 percent by weight of polysaccharide amino ether containing quaternary ammonium groups;

(c) from about 0 to 60 percent by weight of builder salt; and

(d) the ramainder customary additives.

4,289,643

STABILIZATION OF ANHYDROUS SODIUM METASILICATE

Daniel Joubert, Trevoux, France, assignor to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 877,882, Feb. 15, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 71,028

Claims priority, application France, Feb. 16, 1977, 77 04380

Int. Cl.³ C11D *7/54*

U.S. Cl. 252—103 **12 Claims**

1. A composition of matter comprising (i) anhydrous sodium metasilicate, and (ii) a minor amount of an inorganic molecular water donor including either bound water of hydration or free water of sorption which will evolve its water content to the metasilicate (i), at a temperature less than that required for the fusion of sodium metasilicate pentahydrate (72.2° C.), and as will convert from about 1% to about 20% by weight of said anhydrous metasilicate into its said pentahydrate, said water donor (ii) being selected from the group consisting of $Na_2B_4O_7.10H_2O$, $Na_2CO_3.7H_2O$, $Na_2HPO_4.7H_2O$, $Na_2HPO_4.12H_2O$, $(NaPO_3)_3.6H_2O$, $Na_2SO_4.10H_2O$, a caustic compound and silica.

4,289,644

PRE-WASH STICK CLEANER

Roger C. Steinhauer, Park Forest, and Isabelle M. Gabriel, Chicago, both of Ill., assignors to Armour-Dial, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 941,829, Sep. 11, 1978, abandoned. This application Jun. 4, 1980, Ser. No. 156,324

Int. Cl.³ C11D *50/00, 9/26, 17/00*

U.S. Cl. 252—127 **7 Claims**

1. A pre-wash cleaner composition comprising the following ingredients by weight made into a solid, non-thixotropic stick: about 70% of a balanced system of paraffinic hydrocarbon solvents having an average molecular weight of about 143, and a boiling point about 300°±5° F., and nonionic detergents having the equivalent of about 3 ethylene oxide units; about 15% tallow soap; and about 15% sorbitol (70%).

4,289,645

HYDROQUINONE AND MU-AMINE COMPOSITIONS

John A. Muccitelli, Feasterville, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Jul. 14, 1980, Ser. No. 168,989

Int. Cl.³ C02B *1/23;* **C23F** *11/06, 11/12, 11/14*

U.S. Cl. 252—178 **17 Claims**

1. A composition which is useful for reducing the amount of oxygen in an oxygen containing aqueous medium, said composition consisting of hydroquinone and mu-amine, said hydroquinone and mu-amine being present in an amount sufficient to increase the oxygen scavenging efficiency of said hydroquinone.

4. A composition which is useful for reducing the amount of oxygen in an oxygen containing aqueous medium, said composition consisting of water, hydroquinone and mu-amine, said hydroquinone and mu-amine being present in an amount sufficient to increase the oxygen scavenging efficiency of said hydroquinone.

4,289,646

1,1-DIFLUORO-2-CHLOROETHYLENE AS AEROSOL PROPELLANT

Karl-Heinz Mitschke, Odenthal, and Hans Niederprüm, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 11, 1979, Ser. No. 83,900

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846811

Int. Cl.³ C09K *3/30*

U.S. Cl. 252—305 **4 Claims**

1. A container for dispersing a spray comprising a container, a valve sealing the container, a conventional filler within said container to be dispersed as a spray and a pressurized propellant gas comprising 1,1-difluoro-2-chloroethylene.

4,289,647

METHOD OF PRODUCING PROCESS GASES CONTAINING HYDROGEN AND CARBON MONOXIDE FROM ASH OIL

Kurt Tippmer, Recklinghausen, Fed. Rep. of Germany, assignor to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Continuation of Ser. No. 52,618, Jun. 27, 1979, abandoned. This application Jun. 20, 1980, Ser. No. 161,312

Int. Cl.³ C01B *2/06*

U.S. Cl. 252—373 **1 Claim**

1. A method of producing process gases containing hydrogen and carbon monoxide comprising:

(a) mixing an amount by weight of ash oil with a smaller amount by weight of carbon-containing water;

(b) adding steam to the mixture of step (a);

(c) burning the mixture plus steam of step (b) with oxygen enriched gas, downwardly into a gasification reactor to gasify oil under pressure to produce partially burned gases with steam and residual carbon plus ash in fine particles;

(d) quenching the products of step (c) with quenching wash water from a direct gas cooler to form wash water with residual carbon plus ash, and ash in the form of clinker particles, and to separate the unburned gases;

(e) directing the unburned gases of step (d) to the direct gas cooler and cooling the unburned gases in the direct gas cooler with clean wash water to produce the process gases and the quenching wash water for step (d); and

(f) decanting and thickening, in a decanter/thickener, the wash water with residual carbon plus ash from step (d) to form the clean wash water of step (e) at the top, the carbon-containing water of step (a) in the middle, and ash mud at the bottom, of the decanter/thickener.

4,289,648

BLOOD GAS CONTROLS COMPOSITION, METHOD AND APPARATUS

Michael K. Hoskins, Irvine, and Gary D. Christiansen, Yorba Linda, both of Calif., assignors to Ortho Diagnostics, Inc., Raritan, N.J.

Filed Mar. 20, 1979, Ser. No. 22,244

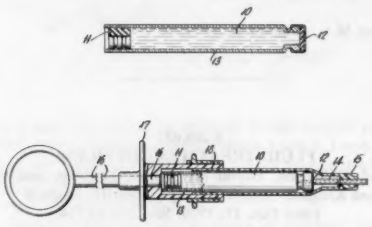
Int. Cl.³ C09K *3/00;* **G01N** *33/16, 31/00*

U.S. Cl. 252—408 **18 Claims**

10. A blood gas control composition which consists essentially of

(a) water

(b) dissolved CO_2 in equilibrium with a water-soluble carbonate or bicarbonate salt source in solution
(c) dissolved oxygen in equilibrium with a water soluble or water suspendible peroxide source in solution



(d) a water soluble pH buffer
(e) said composition having a pH of 7.0–7.7, a pO_2 of from 30 to 170 mm Hg, and a pCO_2 of from 10 to 80 mm Hg

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4,289,649

AQUEOUS LIPID STANDARD SOLUTION

Hans-Dieter Harders, and Roland Helger, both of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 11, 1979, Ser. No. 74,457
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1978, 2839433
Int. Cl.[3] C09K *3/00;* **G01N** *33/48*
U.S. Cl. 252—408 **13 Claims**

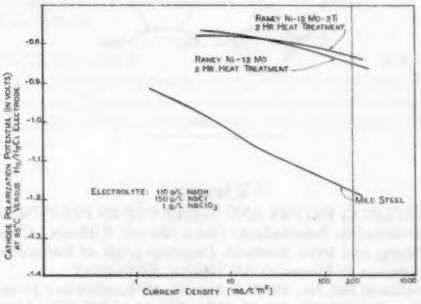
1. A stable, aqueous, substantially alcohol-free lipid standard solution, comprising water, at least one lipid, and an effective lipid-solubilizing amount of both a non-ionic detergent and an ionic detergent; wherein the amount of ionic detergent is from 0.5 to 10% by weight and the amount of the non-ionic detergent is from 2 to 20% by weight.

4,289,650

CATHODE FOR CHLOR-ALKALI CELLS

Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 25,153, Mar. 29, 1979, Pat. No. 4,240,895. This application Oct. 1, 1979, Ser. No. 80,745
Int. Cl.[3] H01M *4/88;* **C25B** *11/06;* **C25D** *5/50*
U.S. Cl. 252—425.3 **8 Claims**


RANEY Ni-13 Mo-2 Ti
2 HR. HEAT TREATMENT
RANEY Ni-12 Mo
2 HR. HEAT TREATMENT
ELECTROLYTE: 110 g/L NaOH
150 g/L NaCl
1 g/L NaClO3
M.S. STEEL
CATHODE POLARIZATION POTENTIAL (IN VOLTS) AT 85°C VERSUS H2/NaCl ELECTRODE
CURRENT DENSITY (AMPS/SQ FT)

1. A method of producing a low overvoltage electrode for use as a hydrogen evolution cathode in an electrolytic cell which comprises the steps of:
(a) preparing a clean surface of a non-porous conductive base metal structure of a nickel-titanium-molybdenum alloy of a weight percent molybdenum within the range of from about 5 to about 20, a weight percent titanium within the range of from about 1 to about 5 and a weight percent nickel within the range of from about 75 to about 94;
dipping said structure into molten aluminum to apply a coating of molten aluminum to said clean surface;
(c) heat treating said coated surface by maintaining said surface at a temperature within the range of from about 660° to about 750° C. for no more than six hours to provide sufficient time to diffuse a portion of said aluminum into outer portions of said structure to produce an integral nickel-molybdenum-aluminum alloy layer in said outer portions consisting predominately of $NiAl_3$ type grains but insufficient time to create a predominance of Ni_2Al_3 type grains in said outer portions; and
(d) leaching out residual aluminum and aluminide intermetallics from the alloy layer until a Raney nickel-molybdenum-titanium layer having a thickness of less than about 75 microns is formed integral with said structure.

4,289,651

SUPPORTED CATALYSTS FOR THE POLYMERIZATION OF ALPHA-OLEFINS

Kenneth C. Benton, Garfield Hts.; James R. Mooney, South Russell, and Raymond J. Weinert, Jr., Garfield Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 20, 1979, Ser. No. 106,078
Int. Cl.[3] C08F *4/02*
U.S. Cl. 252—429 B **7 Claims**

1. A catalyst comprising a Ziegler-type transition metal complex and a planar organosilicon polymer support derived from at least one of chrysotile and apophyllite.

4,289,652

CATALYST COMPRISING A METAL SUBSTRATE

James B. Hunter, Newton Square; George McGuire, West Chester; A. F. D'Alessandro, Havertown, and Larry L. Lawlor, Glenmoore, all of Pa., assignors to Johnson Matthey Inc., Malvern, Pa.

Continuation of Ser. No. 876,565, Feb. 10, 1978, Pat. No. 4,196,099. This application Feb. 1, 1980, Ser. No. 117,555
The portion of the term of this patent subsequent to Apr. 11, 1997, has been disclaimed.
Int. Cl.[3] B01J *27/14, 22/16, 35/00*
U.S. Cl. 252—437 **5 Claims**

1. A supported catalyst suitable for use at a temperature above 1200° F. consisting essentially of a metal or alloy substrate which itself is not heat or oxidation resistant at a temperature above 1200° F.; a heat-cured oxidation resistant coating applied to said substrate, said coating being applied as an aqueous coating composition which is curable into water-insoluble oxidation resistant form by heating and which consists essentially of a dispersion of aluminum metal powder in an aqueous chromium-containing/aluminum phosphate binder composition; a high surface area refractory oxide washcoat over said oxidation resistant coating and a catalytically active platinum group metal deposited on said washcoat.

4,289,653

COMULLED SILICA-ALUMINA BASE DENITRIFICATION CATALYST

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 968,589, Dec. 11, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,304
Int. Cl.[3] B01J *21/12*
U.S. Cl. 252—453 **4 Claims**

1. An extruded silica-alumina catalyst prepared by the method which consists essentially of the following steps:
mixing a sodium silicate solution with an aqueous aluminum sulfate solution and sulfuric acid to form an acidified silica sol in an alumina salt solution having a pH in the range of about 1 to 3;

adding sufficient ammonium hydroxide to said acidified silica sol in the aluminum salt solution to form a cogelled mass of silica and alumina under substantially constant pH conditions and at a pH of at least 4;
adding additional ammonium hydroxide to the cogelled mass to obtain a pH in the range of 7.5 to 8.5;
washing the cogelled mass;
mulling the cogelled mass with a peptizing agent, a Group VI-B metal compound and a Group VIII metal compound to form an extrudable dough;
extruding said dough;
and drying and calcining the extruded dough.

4,289,654

SUPPORTED CATALYST FOR THE OXIDATION OF ACROLEIN INTO ACRYLIC ACID

Natale Bertolini, Milan, and Natale Ferlazzo, Segrate, both of Italy, assignors to Euteco Impianti S.p.A., Milan, Italy

Filed Dec. 6, 1979, Ser. No. 100,807
Claims priority, application Italy, Dec. 12, 1978, 30718 A/78
Int. Cl.³ B01J *23/20, 23/24*
U.S. Cl. 252—456 **18 Claims**

1. A catalyst active in the oxidation of acrolein into acrylic acid, which comprises a silica or alumina support and from 15 to 80% by weight, with respect to the catalyst, of a catalytically active part having the following chemical composition

$$Mo_aV_bW_cCu_dX_xO_y$$

wherein X is Cr, Mn, Fe, Co, Ni, Zn, Cd, Al or Sb and wherein for a=12, b ranges from 4 to 8, c ranges from 1 to 4, d ranges from 2 to 5, x ranges from 0 to 1 and y ranges from about 17 to about 72; said active part having an amorphous and bidimensional structure with an interplanar distance of 3.98 A, as measured by X rays; and an IR spectrum with a somewhat broad band at 860 cm^{-1} attributable to the tetrahedral coordination of the oxygen atoms with respect to the metal atoms; and said catalyst being obtained by impregnating the support with an aqueous solution of decomposable salts of the metals of said active part, drying the thus impregnated support and activating at high temperature the support thus dried, the activation stage being carried out firstly in an oxidizing atmosphere and then in an inert atmosphere, the cycle of impregnation, drying and activation being then repeated at least one time and the activation of the last cycle being followed by a thermal treatment in an oxidizing atmosphere.

4,289,655

MAGNETIC CATALYSTS AND THEIR PREPARATION

George W. Bailey, Baton, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 27, 1980, Ser. No. 153,408
Int. Cl.³ B01J *21/04, 21/06, 23/89*
U.S. Cl. 252—466 B **15 Claims**

1. A composition of matter useful in a bed which can be fluidized by contact with a fluidizing medium while simultaneously subjected to an applied magnetic field comprising, particulate, magnetizable composite solid particles comprised of an ilmenite magnetic iron component dispersed within an inorganic oxide matrix, the iron component of the ilmenite being comprised of from about 0.05 percent to about 50 volume percent metallic iron in reduced state.

4,289,656

CATALYST FOR THE PREPARATION OF ETHYLENIMINE

William V. Hayes, Clute, and David L. Childress, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 17, 1980, Ser. No. 169,563
Int. Cl.³ B01J *23/84, 23/86*
U.S. Cl. 252—470 **2 Claims**

1. A catalyst suitable for the dehydration of alkanolamine to obtain alkylenimine which comprises the oxides of niobium or tantalum and iron and chromium wherein the atomic ratio of the metals in the catalyst is

$$M_{10}\ Fe_{0.5\text{-}2.9}\ Cr_{0.3\text{-}1.7}$$

wherein M is tantalum or niobium.

4,289,657

FLUID TREATMENT DEVICES

Richard S. Nelson, Goring-on-Thames, England, assignor to United Kingdom Atomic Energy Authority, England

Filed Oct. 17, 1979, Ser. No. 85,754
Claims priority, application United Kingdom, Oct. 27, 1978, 42175/78
Int. Cl.³ B01J *35/00;* **B01D** *47/00;* **B01J** *8/00;* **B05D** *5/12*
U.S. Cl. 252—477 R **9 Claims**

1. A device for use in the treatment of a fluid by catalysis which comprises one or more sheets of interconnected coils laid up to give more than one layer of coils, said layers being in touching contact with one another, the or each sheet comprising a plurality of elongate helically wound coils of wire-form wherein the space between adjacent windings of each coil is less than the diameter of the wire-form and wherein each coil carries a coating of catalytically active material, the coils being arranged with their longitudinal axes substantially parallel to one another and being interconnected by a connecting member to form a sheet of interconnected coils.

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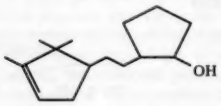
2-[-(2′2′3′-TRIMETHYL-3′-CYCLOPENTEN-1′-yl)-ETHYLIDEN]-AND ETHYL]-CYCLOPENTANOLS

Brian J. Willis, Bergenfield, and John M. Yurecko, Jr., Bayonne, both of N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Sep. 19, 1979, Ser. No. 77,037
Int. Cl.³ C07C *35/21;* **A61K** *7/46*
U.S. Cl. 252—522 R **5 Claims**

1. The compound having the structure



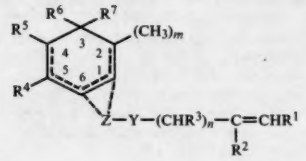
4,289,659

CYCLIC C_6 ESTERS AND THEIR USE IN PERFUMES

Karl-Heinrich Schulte-Elte, Onex; Bruno Willhalm, Chene-Bourg, and Fritz Gautschi, Commugny, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 935,263, Aug. 21, 1978, which is a division of Ser. No. 708,075, Jul. 23, 1976, Pat. No. 4,147,672, which is a continuation-in-part of Ser. No. 541,988, Jan. 17, 1975, abandoned. This application May 5, 1980, Ser. No. 146,224
Claims priority, application Switzerland, Jan. 29, 1974, 1147/74
Int. Cl.³ C11B *9/00;* **C07C** *69/74*
U.S. Cl. 252—522 R **5 Claims**

1. A compound of formula



having a saturated ring or an isolated double bond in position 1, 4 or 6 or two double bonds in position 1 and 4, 1 and 5, or 4 and 6 of the ring as indicated by the dotted lines, and wherein:

m stands for integers 0 or 1;

n stands for integers 0, 1 or 2;

Z is bound to the ring carbon atoms in position 1 or 6 and represents the group —CO;

Y represents an oxygen atom;

each of the symbols R^1, R^2, R^3, R^4 and R^5 designates a hydrogen atom or one of them represents a methyl radical and each of the others a hydrogen atom, and each of the symbols R^6 and R^7 represents an alkyl radical having from 1 to 3 carbon atoms or one of them represents an alkyl radical as defined above and the other a hydrogen atom.

4,289,660

PERFUME COMPOSITIONS CONTAINING TRICYCLO[5.2.1.$0^{2,6}$]DECANE CARBOXYLIC ACID ESTERS

Ulf-Armin Schaper, Düsseldorf, and Klaus Bruns, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

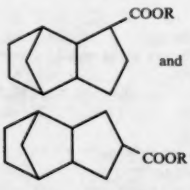
Continuation of Ser. No. 65,606, Aug. 10, 1979. This application Jul. 21, 1980, Ser. No. 170,914

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835445

Int. Cl.[3] **A61K** *7/46;* **C11B** *9/00*

U.S. Cl. 252—522 R **3 Claims**

1. A perfume composition comprising as a perfume from about 1 to 50 percent by weight of an isomeric mixture of tricyclo[5.2.1.$0^{2,6}$]decane carboxylic acids of the general formulas



(I)

and

(II)

wherein R represents a saturated or unsaturated linear or branched aliphatic hydrocarbon radical having from about one to five carbon atoms, the remainder comprising customary constituents including at least one other fragrance substance.

4,289,661

ACETYL HYDRINDACENES, ACETYL INDANES, MIXTURES OF SAME, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Joaquin Vinals, Red Bank, N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

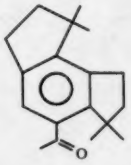
Division of Ser. No. 156,736, Jun. 5, 1980, which is a division of Ser. No. 953,180, Oct. 20, 1978, Pat. No. 4,209,543. This application Sep. 18, 1980, Ser. No. 188,523

Int. Cl.[3] **A23L** *1/235*

U.S. Cl. 252--522 R **10 Claims**

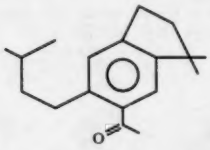
1. A process for augmenting or enhancing the aroma of a perfume composition or a cologne comprising the step of adding to a perfume base or a cologne base an aroma augmenting or enhancing quantity of at least one chemical substance selected from the group consisting of:

A. 4-acetyl-3,3,8,8-tetramethyl-as-hydrindacene having the structure



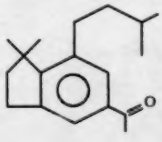
existing in the liquid phase at ambient temperature and pressure;

B. 6-acetyl-5-(3-methylbutyl)-1,1-dimethylindane having the structure:



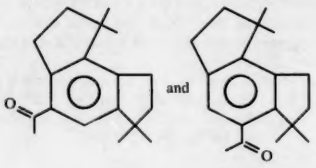
existing in the liquid phase at ambient temperature and pressure;

C. 5-acetyl-7-(3-methylbutyl)-1,1-dimethylindane having the structure:

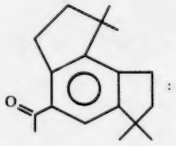


existing in the liquid phase at ambient temperature and pressure;

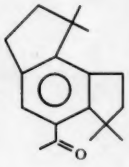
D. A mixture of acetyl hydrindacene having the structures:



existing in the liquid phase at ambient temperature and pressure, the weight ratio of the compound having the structure:

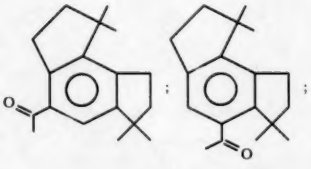


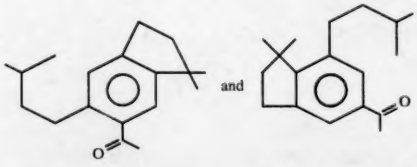
the compound having the structure:



being 40:60; and

E. A mixture of acetyl indanes and acetyl hydrindacenes having the structures:





existing in the liquid phase at ambient temperature and pressure.

4,289,662

METHOD OF MAKING CRUDE BORIC ACID FROM BORATE AND SULFURIC ACID

James R. Blasius, Phoenix, Ariz., assignor to HJH Chemicals, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 892,157, Mar. 31, 1978, Pat. No. 4,156,654. This application Mar. 12, 1979, Ser. No. 19,633
The portion of the term of this patent subsequent to May 29, 1996, has been disclaimed.
Int. Cl.[3] C09K *3/28*
U.S. Cl. 252—607 10 Claims

1. A method for making an essentially dry, free-flowing particulate mixture comprising boric acid and sodium sulfate, said method comprising the steps of:

a. introducing sodium tetraborate into a mixing zone;

b. introducing 0.95–0.98 mole of sulfuric acid and exothermically reacting said sulfuric acid with said sodium tetraborate to obtain a mixture of sodium sulfate and boric acid;

c. maintaining the temperature of said mixing zone above 100° C. but below about 150° C. until a generally free-flowing, moist, particulate mixture is obtained.

4,289,663

METHOD OF PRODUCING SYNTHETIC RESIN FROM WASTE PRODUCTS

Ingvar K. G. Johansson, Kungsängen, Sweden, assignor to Svenska Traforskningsinstitutet, Stockholm, Sweden

Filed Mar. 2, 1979, Ser. No. 17,077
Claims priority, application Sweden, Mar. 2, 1978, 7802393
Int. Cl.[3] C08L *97/00*
U.S. Cl. 260—17.5 6 Claims

1. A method for producing an adhesive for wood products comprising the steps of:

(a) heating a waste product containing sugar in a strongly acidic environment at a pH of from 0.1 to 2.0 to produce a reaction mixture containing furfural derivatives, and

(b) reacting said reaction mixture at a pH in the range of from 1.0 to 4.0 and at a solids content of from about 50 to 60%, without separating furfural therefrom, with lignin to form an adhesive binder containing the condensation products of said lignin and said furfural derivatives.

4,289,664

GLASS FIBER BONDING RESINS

I. Luis Gomez, Longmeadow, and Robert Cole, Three Rivers, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 14, 1980, Ser. No. 140,280
Int. Cl.[3] B32B *17/04;* C03C *27/10;* C08G *8/10*
U.S. Cl. 260—19 R 13 Claims

1. A resin binder composition comprising a novolac resin; from 0.5 to 8% by weight of a polyunsaturated vegetable oil having a polyunsaturated content of at least 40% by wt. and an iodine value of from 80 to 200; and from 0.2 to 2.0% by weight of a polyoxyethylene adduct selected from the group consisting of adducts of polyethylene glycol with alcohols, ethers, esters and acids.

4,289,665

PROCESS FOR THE PREPARATION OF AQUEOUS EMULSIONS, STABLE IN STORAGE, OF N.ALKYL-N-ALKYLOL-UREAS AND THEIR APPLICATION FOR THE SOFTENING OF LEATHER

Gustav Hudec, Schwalbach; Karl-Heinz Keil, Offenbach-Bieber; Volker Köhler, Niedernhausen, and Kurt Rosenbusch, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main-Fechenheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 970,224, Dec. 18, 1978, abandoned. This application Aug. 17, 1979, Ser. No. 67,273

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757582

Int. Cl.[3] D06M *13/40;* D06P *5/00;* C14C *9/00*

U.S. Cl. 260—21 11 Claims

1. Conditioning and water-repellent agent for leather comprising a homogeneous mixture of

(a) 10 to 35% by weight of a substance of the formula

$$R-NH-\underset{\underset{O}{\|}}{C}-NH_n(CH_2OH)_m$$

wherein R is linear or branched alkyl or alkenyl each having 14 to 22 carbon atoms, m is a number average from 1.0 to 1.5 and n is 2 minus m;

(b) 0 to 10% by weight of non-ionic emulsifiers;

(c) 0 to 3% by weight of anionic emulsifiers with the proviso that the sum of (b) and (c) is 0.5 to 10%;

(e) 5 to 25% by weight of fat liquors; and

(f) 25 to 89.5% by weight of water or a water-miscible organic solvent.

4,289,666

ADHESIVE CORRECTION COMPOSITION AND METHOD OF USE

Fred M. Creekmore; Dorothy J. Kennair; Benjamin F. Livingston; James F. Martone, and Joseph J. Sabad, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,676

Int. Cl.[3] C08L *23/06, 91/00;* B41J *29/16*

U.S. Cl. 260—23 H 31 Claims

1. A low tack pressure sensitive composition comprising:

(a) about 15–35% by weight of polyethylene;

(b) about 20–65% by weight of a hydrocarbon tackifying polymer;

(c) about 7–25% by weight of a tacky semi-solid isobutylene polymer having a viscosity average molecular weight (FLORY) of at least about 40,000;

(d) about 10–20% by weight of a copolymer of an olefin selected from the group of ethylene, propylene, or mixtures thereof; and a monoethylenically unsaturated ester wherein the copolymer contains about 18 to about 40% by weight of said ester; and

(e) about 0.5 to about 5% by weight of a nonvolatile carboxylic acid, or ester thereof or mixture thereof.

4,289,667

EMULSION POLYMERIZATION PROCESS WITH LOW EMULSIFIER CONCENTRATION

Charles N. Bush, Bay Village, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 21, 1980, Ser. No. 113,840

Int. Cl.[3] C08F *2/18, 2/20*

U.S. Cl. 260—23 XA 19 Claims

1. A process of producing polymers of vinyl and vinylidene halides and copolymers thereof with each other or either with one or more polymerizable olefinic monomers having at least one terminal $CH_2{=}C<$ group comprising, forming a monomer premix containing the monomer or monomers to be polymerized, the aqueous reaction medium, from about 0.01% to about 0.5% by weight of a water-insoluble, free radical yielding catalyst, based on the weight of 100 parts of monomer or monomers being polymerized, an emulsifier, from about 0.1% to about 1.0% by weight, based on the weight of 100 parts of monomer(s), of a water-insoluble plasticizer, homogenizing said entire premix at a temperature below the reactivity of the catalyst or catalysts employed, polymerizing said homogenized premix in a reaction zone at a temperature in the range of about 30° C. to about 70° C. while maintaining the pH thereof in the range of about 2.0 to about 10.5 until the reaction is complete, and thereafter recovering the polymer or copolymer, and wherein polymer buildup in said reaction zone is substantially reduced.

3. A process of producing polymers of vinyl and vinylidene halides and copolymers thereof with each other or either with one or more polymerizable olefinic monomers having at least one terminal $CH_2{=}C<$ group comprising, forming a monomer premix containing the monomer or monomers to be polymerized, the aqueous reaction medium, from about 0.01% to about 0.5% by weight of a water-insoluble, free radical yielding catalyst, based on the weight of 100 parts of monomer or monomers being polymerized, an emulsifier system comprised of from about 0.6% to about 1.2% by weight, based on the weight of 100 parts of monomer(s), of compounds selected from the group consisting of alkali metal or ammonium salts of long chain saturated fatty acids containing from 8 to 20 carbon atoms and alkali metal or ammonium salts of the sulfates of alcohols containing from 8 to 18 carbon atoms, from about 0.1% to about 1.0% by weight, based on the weight of 100 parts of monomer(s), of a water-insoluble plasticizer, homogenizing said entire premix at a temperature below the reactivity of the catalyst or catalysts employed, polymerizing said homogenized premix in a reaction zone at a temperature in the range of about 30° C. to about 70° C. while maintaining the pH thereof in the range of about 2.0 to about 10.5 until the reaction is complete, and thereafter recovering the polymer or copolymer, and wherein polymer buildup in said reaction zone is substantially reduced.

4,289,668

POLYMER SYSTEMS PLASTICIZED WITH HYDROXY FATTY ACIDS

George S. Li, Macedonia, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 14, 1980, Ser. No. 196,885

Int. Cl.[3] C08L *91/00*

U.S. Cl. 260—23 AR 21 Claims

1. A plasticized resin system comprising an intimate mixture of

(a) an interpolymer derived from (i) at least one vinyl monomer and (ii) an α,β-unsaturated dicarboxylic acid anhydride or the lower alkyl esters thereof, and

(b) a plasticizing amount of a hydroxy substituted fatty acid containing at least about 8 carbon atoms.

4,289,669

ALKALI-SOLUBLE HOT MELT ADHESIVE COMPOSITIONS

Pallavoor R. Lakshmanan, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1980, Ser. No. 172,596

Int. Cl.[3] C08L *93/00, 93/04*

U.S. Cl. 260—27 EV 6 Claims

1. An alkali-soluble hot melt adhesive composition consisting essentially of:

(a) 10–30 weight % of an alkenyl succinic anhydride,

(b) 30–50 weight % of an ethylene polymer having an acid number of about 0.25–30.0, and

(c) 10–50 weight % of a rosin material selected from natural rosins, hydrogenated rosins and isomerized rosins;

said alkenyl succinic anhydride having been prepared by heat-

ing a high molecular weight alpha-olefin containing 30 or more carbon atoms with maleic anhydride.

4,289,670

PRESSURE SENSITIVE CORRECTION COMPOSITION AND METHOD OF USE

Fred M. Creekmore; Dorothy J. Kennair; Benjamin F. Livingston, and Joseph J. Sabad, all of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1979, Ser. No. 105,475

Int. Cl.³ B41J *29/16;* **C08L** *23/06, 91/00*

U.S. Cl. 260—28.5 AV **31 Claims**

1. A low tack pressure sensitive composition comprising:

(a) about 5–35% by weight of a material selected from the group of paraffinic wax, polyethylene reisn, or mixtures thereof, and wherein said paraffinic wax is selected from the group of paraffin wax, synthetic polyolefin wax, or mixtures thereof;

(b) about 20–65% by weight of a hydrocarbon tackifying polymer;

(c) about 7–25% by weight of a tacky, semisolid isobutylene polymer having a viscosity average molecular weight (FLORY) of at least about 40,000; and

(d) about 10–48% by weight of a copolymer of an olefin selected from the group of ethylene, propylene, or mixtures thereof; and a monoethylenically unsaturated ester whercin the copolymer contains about 18 to about 40% by weight of said ester.

4,289,671

COATING COMPOSITION FOR DRAWING AND IRONING STEEL CONTAINERS

Pablo M. Hernandez, Waukegan, Ill., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 3, 1980, Ser. No. 156,148

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—28.5 AV **3 Claims**

1. An improved, sacrificial aqueous coating composition for use in drawing and ironing steel containers comprising:

(a) from about 10 to 35% by weight molybendum disulfide;

(b) from about 4 to 7% by weight of a low molecular weight resin having a monomer content of from about 25 to 35% acrylic acid, and from about 65 to 75% of a styrene monomer selected from the group consisting of styrene, alpha-methyl styrene, and mixtures thereof;

(c) from about 10 to 25% by weight of an aqueous wax emulsion containing from about 15 to 25% non-volatiles;

(d) from about 3 to 7% by weight of a high molecular weight acrylic polymer comprising from about 25 to 60% of a styrene monomer selected from the group consisting of styrene, alpha-methyl styrene and mixtures thereof, from about 30 to 50% by weight of an ester selected from methyl methacrylate, methyl acrylate, ethyl acrylate, ethyl methacrylate, butyl acrylate and mixtures thereof, and from about 10 to 25% of an acid selected from the group consisting of acrylic acid and methacrylic acid;

(e) from about 1 to 5% by weight of a solvent selected from the group consisting of diethylene glycol monoethyl ether, diethylene glycol monobutyl ether, dipropylene glycol monomethyl ether, dipropylene glycol monoethyl ether and mixtures thereof;

(f) from about 0.1 to 0.25% by weight of a water soluble zinc containing salt, and

(g) from about 35 to 55% by weight water.

4,289,672

SIZING GLASS FIBERS FOR THERMOPLASTIC RESIN REINFORCEMENT

Klaus Friederich, Leverkusen, Fed. Rep. of Germany; Gerhard Heinze, Shildgen, Fed. Rep. of Germany; Helmut Reiff, New Martinsville, W. Va.; Dietrich Michael, Krefeld, Fed. Rep. of Germany; Manfred Schön; Peter Markusch, both of Cologne, Fed. Rep. of Germany; Ulrich Haberland, Krofald, Fed. Rep. of Germany; Dieter Dieterich, Leverkusen, Fed. Rep. of Germany, and Josef Merten, Korchenbroich, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 882,486, Mar. 1, 1978, abandoned, which is a continuation of Ser. No. 797,156, May 16, 1977, abandoned, which is a continuation of Ser. No. 581,324, May 27, 1975, abandoned. This application Feb. 21, 1979, Ser. No. 13,648

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1974, 2426657

Int. Cl.³ C08L *75/06*

U.S. Cl. 260—29.2 TN **16 Claims**

1. An aqueous dispersion suitable for use as a sizing composition for glass fibers comprising a polyurethane anionomer as a film-forming agent, said polyurethane anionomer being characterized by

(a) an average particle size of about 0.05μ to 0.5μ,

(b) an ionic group content of about 5 to 30 milliequivalents per 100 g, and

(c) forming a film when dried, this film having a tensile strength of at least about 50 kp/cm^2, an elongation at break of about 100–600%, a Shore-A-hardness of about 50–90, a swelling in water of less than about 30%, and being insoluble in 80% aqueous tetrahydrofuran after heating to 140° C.

4,289,673

PROCESS FOR PRODUCING DURABLE-PRESS COTTON FABRICS WITH IMPROVED BALANCES OF TEXTILE PROPERTIES

Stanley P. Rowland, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 8,130, Jan. 31, 1979. This application Feb. 6, 1980, Ser. No. 118,949

Int. Cl.³ C08L *61/22, 61/28, 61/32*

U.S. Cl. 260—29.4 R **1 Claim**

1. A chemical composition for imparting to cellulosic textiles improved balances of physical properties, including resilience, strength, abrasion resistance and hydrophilicity, the composition comprising an aqueous solution containing about 3% to 20% of N-methylol reagent selected from the group consisting of:

dimethyloldihydroxyethyleneurea,

dimethylolethyleneurea,

methylolated alkyl carbamates,

methylated methylolmelamines, and

dimethylol alkyltriazones;

about from 0.25 to 4.0% of a Brϕnsted acid or acid-generating catalyst selected from the group consisting of:

an ammonium, sodium, or potassium bisulfate,

a magnesium or aluminum bisulfate,

an ammonium, sodium, or potassium persulfate, and

a phosphoric, pyrophosphoric, or phosphorus acid; and

a phosphate salt or mixture of salts selected from the group consisting of:

ammonium, sodium, potassium monohydrogen and dihydrogen phosphates.

4,289,674

BASE-SOLUBILIZED ACRYLIC POLYMERS AND AQUEOUS RESINOUS DISPERSIONS OF ACRYLIC POLYMERS AND EPOXY RESINS

Roger M. Christenson, Gibsonia; Rudolf Maska, Pittsburgh; Rostyslawa Dowbenko, and Thomas R. Hockswender, both of Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 964,549, Nov. 29, 1978. This application Jul. 9, 1979, Ser. No. 55,937

Int. Cl.[3] C08L *33/02*

U.S. Cl. 260—29.6 NR 20 Claims

1. An aqueous, base-solubilized resinous dispersion in which the resinous phase comprises:

(A) 15 to 90 percent by weight of an acrylic polymer which is formed by solution polymerizing in the absence of primary and secondary alcohols other than ethanol, the following monomer charge:

(1) 15 to 85 percent by weight of an alpha, beta-ethylenically unsaturated carboxylic acid,

(2) 5 to 85 percent by weight of N-ethoxymethylacrylamide or N-ethoxymethylmethacrylamide,

(3) 0 to 80 percent by weight of a copolymerizable vinyl monomer different from (1) and (2); the percentages by weight of (1), (2) and (3) being based on total weight of (1), (2) and (3);

(B) 10 to 85 percent by weight of an epoxy resin; the percentages by weight of (A) and (B) being based on total weight of (A) and (B).

4,289,675

AIR DRYING LATEX COATING COMPOSITION CURABLE UNDER AMBIENT CONDITIONS AND METHOD OF PROVIDING SAME

John J. Krajewski, Wheeling, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Dec. 3, 1979, Ser. No. 99,568

Int. Cl.[3] C08L *29/04, 31/00, 33/24*

U.S. Cl. 260—29.6 CM 23 Claims

1. An air drying latex coating composition which cures under ambient conditions comprising water having dispersed therein aqueous emulsion copolymer particles consisting essentially of copolymerized monoethylenically unsaturated monomers, the copolymer particles of said latex having ethylenic unsaturation provided by the reaction of reactive groups in the copolymer particles with a reactive ethylenically unsaturated monomer bonded thereto through a reacted C_1–C_6 N-alkylol functionality, said unsaturated monomer which is bonded to the copolymer particles being present in an amount of about 0.5% to about 30% by weight of the copolymer, and a curing catalyst or curing agent incorporated in the latex to cause said unsaturation to react in a deposited coating to cure the same.

4,289,676

BINDERS, IMPREGNATING AGENTS AND COATING AGENTS BASED ON AN AQUEOUS DISPERSION OF AN AMIDE-CONTAINING COPOLYMER

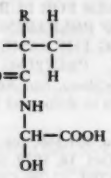
Bernhard Czauderna, Hirschberg; Andreas Einwiller, Mannheim, and Kaspar Bott, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,695

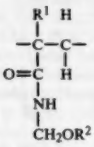
Int. Cl.[3] C08L *33/24*

U.S. Cl. 260—29.6 H 8 Claims

1. A binder, impregnating agent and coating agent based on an aqueous dispersion of an amide-containing copolymer which contains from 3 to 6% by weight of recurring units of formula I:



when R is H and/or CH_3, up to 3% by weight of units of formula II:



when R^1 is H or CH_3 and R^2 is H or alkyl of 1 to 4 carbon atoms, and not less than 85% by weight of

(a) a mixture of from 40 to 60 parts by weight of styrene and/or acrylonitrile and from 60 to 40 parts by weight of butadiene or

(b) vinyl monomers selected from the group consisting of esters of acrylic acid or methacrylic acid with alkanols of 1 to 8 carbon atoms, vinyl esters and vinyl chloride, together with up to 40% by weight, based on total monomers (b), of acrylonitrile, styrene or butadiene,

and from 0 to 5% by weight of α,β-monoolefinically unsaturated monocarboxylic acids and/or dicarboxylic acids of 3 to 5 carbon atoms and/or their amides, the said monomers being present as copolymerized units.

4,289,677

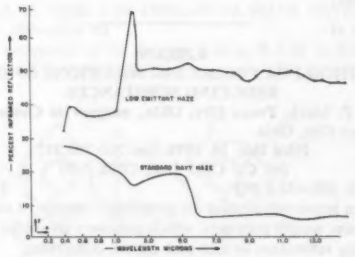
FORMULATION FOR PRODUCING LOW INFRARED COATING IN THE 2-15 MICRON RANGE

Robert F. Supcoe, 1227 Mt. Pleasant, Rt. 9, and Melvin Greenberg, 314 Dewey Dr., both of Annapolis, Md. 21401

Continuation-in-part of Ser. No. 173,940, Aug. 23, 1971, abandoned. This application Sep. 10, 1979, Ser. No. 73,815

Int. Cl.[3] C09D *3/82, 5/32, 5/38*

U.S. Cl. 260—33.6 SB 4 Claims



1. A diffuse gray coating mixture having a low infrared emittance and comprising by weight:

from about 10% to about 22% coarse non-leafing aluminum powder;

from about 2% to about 15% cobalt metal;

from about 2% to about 5% cobalt oxide;

from about 7% to about 20% titanium dioxide;

from about 65% to about 75% silicone alkyd resin and from about 1% to about 4% polarized montmorrilite clay.

4,289,678

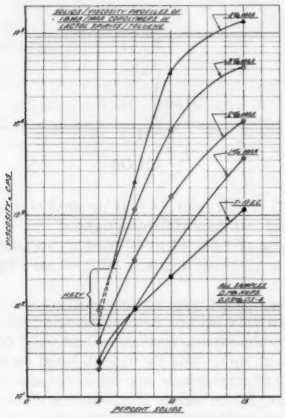
ACRYLIC THICKENER FOR PUBLICATION GRAVURE INKS, METHOD OF PREPARING SAID THICKENER, INK CONTAINING THE SAME AND METHOD OF PRINTING

G. Vincent Calder, Richboro, and Andrew Mercurio, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 831,466, Sep. 8, 1977, abandoned. This application Oct. 16, 1979, Ser. No. 85,359

Int. Cl.[3] C08K *5/01;* C08L *93/04;* C08F *220/06;* C09D *11/10*

U.S. Cl. 260—33.6 UA 31 Claims



1. A thickened organic solvent composition containing dissolved therein a thickening amount of an addition polymer of ethylenically unsaturated (A) hydrophobic monomers being in the hydrogen bonding class of from moderate to poor, and (B) hydrophilic monomers being in the strong hydrogen bonding class, in a ratio of between 90(A):10(B) and 99.9(A):0.1(B), at least about 60% of the hydrophobic monomer or monomers being those whose homopolymers have a solubility parameter of ≦8.8, any other hydrophobic monomer(s) and all hydrophilic monomers being such, in quantity and nature, as to not destroy the organic solvent solubility of the addition polymer, the T_g of the polymer being ≧30° C., and the weight average molecular weight of the polymer being from about 100,000 to 2,000,000.

4,289,679

METHOD FOR PRODUCING SOLUTIONS OF DRAG REDUCING SUBSTANCES

Mark P. Mack, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Dec. 14, 1979, Ser. No. 103,317

Int. Cl.[3] C08J *3/08;* C08K *5/01*

U.S. Cl. 260—33.6 PQ 5 Claims

1. An improved method for producing solution of ultrahigh molecular weight polymers, which polymers are useful as drag reducing substances or anti-mist agents, comprising

(1) polymerizing an alpha olefin or mixtures of alpha olefins containing from 2 to 30 carbon atoms in the presence of a Ziegler/Natta catalyst system to at least 5% of the monomer present in a polymerization grade hydrocarbon diluent;

(2) adding the polymerization mixture obtained to a relatively heavy hydrocarbon diluent having a boiling point difference from the polymerization mixture sufficient to allow separation; and

(3) removing substantially all polymerization grade hydrocarbon components, leaving the polymer dissolved in the heavy hydrocarbon diluent.

4,289,680

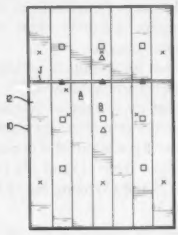
HEAT RESISTANT AND FIRE-PROOF SYNTHETIC RESIN MATERIAL CONTAINING INORGANIC SUBSTANCES AND PROCESS OF PRODUCING SAME

Junichi Kimura, Higashine, Japan, assignor to Ishikawa Giken Kogyo Kabushiki Kaisha, Yamagata, Japan

Continuation-in-part of Ser. No. 464,195, Dec. 9, 1974, abandoned. This application May 3, 1979, Ser. No. 35,516

Int. Cl.[3] B32B *3/26, 5/18;* C08K *3/34*

U.S. Cl. 260—37 R 9 Claims



1. A heat resistant and fire-proof material consisting essentially of:

(a) a thermosetting synthetic resin; and

(b) a ceramic layer forming component consisting essentially of:

(1) at least one member of the group consisting of boric acid salts and silicic acid salts, and

(2) a filler material consisting essentially of expanded pearlite, the pearlite having the following characteristics:

(i) composition: from about 5 to about 20% by weight of Al_2O_3, the balance being substantially SiO_2;

(ii) bulk density: from about 0.05 to about 0.2 gm/cm^3;

(iii) melting point: higher than about 1000° C. and

(iv) thermal conductivity: from about 0.03 to about 0.10 kcal/mh°C.

4,289,681

BORON CONTAINING PRECIPITATED SILICA

Peter Nauroth, Wesseling; Robert Kühlmann, Erftstadt, and Günter Türk, Hanau, all of Fed. Rep. of Germany, assignors to Deutsch Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jun. 28, 1979, Ser. No. 52,925

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 2829045

Int. Cl.[3] C08L *83/04*

U.S. Cl. 260—37 SB 14 Claims

1. A boron containing precipitated silica having the following physical-chemical data

Loss on heating	Weight %	14–40
pH		4–6
Conductivity in 4% aqueous dispersion	μS	<800
Bulk density	g/l	130 ± 100
Sieve residue according to Alpine >63μ	Weight %	0.1
SiO_2 content based on original material	Weight %	9–76
B_2O_3 content based on original material	Weight %	10–51
Na_2O content based on original	Weight %	<0.5
SO_3 content based on original	Weight %	<0.8

-continued

material

11. A composition comprising a hardenable elastomeric diorganopolysiloxane containing as a filler the boron containing precipitated silica of claim 1.

4,289,682

CURABLE RESIN COMPOSITIONS COMPRISING HYDROXYL-TERMINATED UNSATURATED POLYESTER OLIGOMER, A POLYISOCYANATE, AN ETHYLENICALLY UNSATURATED MONOMER AND A CATALYST

Edward N. Peters, Piscataway, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,084

Int. Cl.³ C08L *75/08*

U.S. Cl. 260—37 N **22 Claims**

1. A curable resin composition comprising:
(a) a hydroxyl-terminated unsaturated polyester oligomer,
(b) a polyisocyanate,
(c) an ethylenically unsaturated monomer, and
(d) a catalyst capable of catalyzing polyurethane-forming reactions of the polyester oligomer and the polyisocyanate.

4,289,683

ADHESION OF POLYAMIDE OR POLYESTER CORDS TO RUBBER

Terry C. Neubert, Kent, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 32,071, Apr. 23, 1979, Pat. No. 4,251,409. This application Oct. 16, 1980, Ser. No. 197,422

Int. Cl.³ C08K *5/20;* **C08L** *61/06*

U.S. Cl. 260—38 **4 Claims**

1. A polyamide or polyester reinforcing element containing from about 3 to 15% by weight dry based on the weight of said element of a heat cured adhesive composition useful for adhering said element to a rubber compound comprising on a dry weight basis 100 parts by weight of a rubbery graft low gel vinyl pyridine copolymer consisting essentially of
(a) a core of a copolymer of butadiene-1,3 and styrene in the parts by weight ratio of butadiene-1,3 to styrene of about 40:60 to 60:40 and having a gel content of from about 0 to below 40% and
(b) a shell of a copolymer of butadiene-1,3 and a vinyl pyridine and having a gel content of from about 0 to below 70% and
(c) where in said graft copolymer the total amount of said monomers is from about 47 to 69% by weight of butadiene-1,3, from 23 to 52% by weight of styrene and from 1 to 8% by weight of the vinyl pyridine and a water-soluble thermosetting phenolic-aldehyde resin in an amount of from about 10 to 40 parts by weight.

4,289,684

SHEET MOLDING COMPOUND

Michael Kallaur, Grafton, Wis., assignor to Freeman Chemical Corporation, Port Washington, Wis.

Filed Apr. 23, 1980, Ser. No. 143,802

Int. Cl.³ C08L *67/06, 63/02, 75/06*

U.S. Cl. 260—40 R **4 Claims**

1. A polymerizable composition of matter which becomes thickened without concomitant gelation and which can be subsequently polymerized from its thickened state to a thermoset mass, said composition comprising:
(A) a resin component comprising:
(1) an unsaturated polyester resin having an acid value less than 25, an ethylenically unsaturated monomer copolymerizable therewith and a free radical initiator, these materials comprising from 10–80 weight percent of said resin component;
(2) a polyhydroxy polyacrylate or polyhydroxy polymethacrylate which is a reaction product of an ethylenically unsaturated monomarboxylic acid and a polyepoxide comprising 10–80 weight percent of said resin component;
(3) an organic diisocyanate in an amount sufficient to supply 0.3 to 0.9 NCO radicals for each hydroxyl radical present in said resin component and a catalyst for the reaction of NCO radicals and hydroxyl radicals; and
(B) a quantity of randomly oriented reinforcing glass fibers.

4,289,685

PROCESS FOR THE PREPARATION OF FLAME-RESISTANT POLYCARBONATES

Frank Druschke, Stuttgart; Dieter Margotte, Krefeld; Erhard Tresper, Krefeld; Ludwig Bottenbruch, Krefeld; Wolfgang Cohnen, Leverkusen, and Uwe Hucks, Alpen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 174,298

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933344

Int. Cl.³ C08K *5/42*

U.S. Cl. 260—45.7 S **4 Claims**

1. In the process of rendering flame-resistant the thermoplastic aromatic polycarbonates prepared by a solution process, the improvement comprising steps
(i) washing the polycarbonate/organic solvent system until neutral and free of electrolytes and
(ii) adding to the neutral and electrolyte free system an effective amount of an aqueous solution of a salt-like flameproofing agent and
(iii) dispersing said aqueous solution, in the form of particulates of less than 2 μm in diameter, in said system and
(iv) isolating the polycarbonate/salt-like flameproofing agent composition by evaporating the water and the organic solvent.

4,289,686

TETRA-ALKYL PIPERIDINE DERIVATIVES AS LIGHT STABILIZERS

Jean Rody, Riehen, and Mario Slongo, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

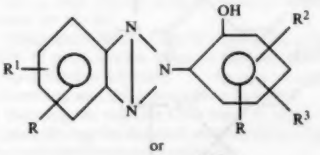
Filed Sep. 17, 1979, Ser. No. 76,106

Claims priority, application Switzerland, Sep. 27, 1978, 10088/78

Int. Cl.³ C08K *5/34;* **C07D** *401/14, 401/04, 491/22*

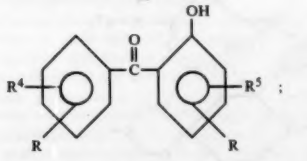
U.S. Cl. 260—45.8 NT **11 Claims**

1. A compound of the formula A-B-A, B-A-B, A-Z-B-Z-A or B-Z-A-Z-B wherein A is



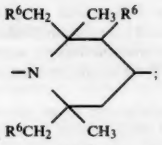
(A I)

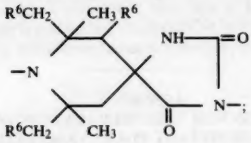
or

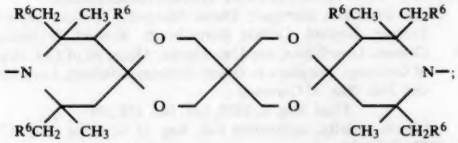


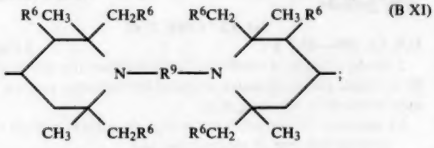
(A II)

for compounds of the formulae A-B-A and A-Z-B-Z-A, B is

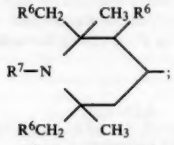

(B III)

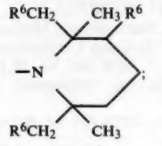

(B VI)

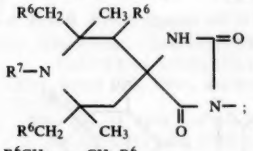

(B IX)

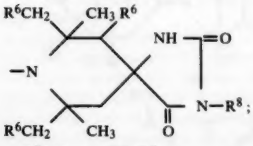

(B XI)

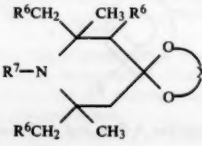
for formula (B XII) wherein R^{12} is a free valency; while for compounds of the formulae B-A-B and B-Z-A-Z-B, B is


(B I)


(B II)


(B IV)


(B V)


(B VII)

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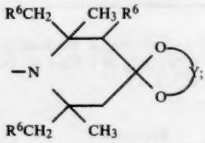
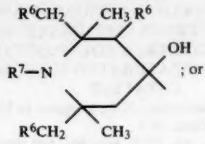
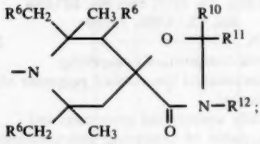
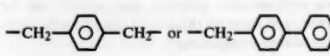

(B VIII)


(B X)

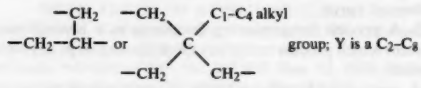

(B XII)

Z is a divalent linking member selected from the group consisting of $-(CH_2)_m-CO-O-$, $-(CH_2)_m-CO-O-R^{14}-$, $-O-(CH_2)_n-CO-O-R^{14}-$, $-CH_2-CH(OH)-CH_2-O-CO-(CH_2)_m$, $-O-CH_2-CH(OH)-CH_2-O-CO-(CH_2)_m-$, $-CH_2-CH(OH)-CH_2-$, $-CH_2-CH(OH)-CH_2-O-$, $-CH_2-CH(OH)-CH_2-N(R^{15})-(CH_2)_m-$, $-O-CH_2-CH(OH)-CH_2-N(R^{15})-(CH_2)_m-$, $-N(R^{15})-CH_2-CH(OH)-CH_2-N(R^{16})-(CH_2)_m$, $-CH_2-CH(R^{13})-O-CH_2-CH(OH)CH_2-N(R^{15})-(CH_2)_m-$, $-CH_2-CH(R^{13})-O-CH_2-CH(OH)-CH_2-O-CO-(CH_2)_m-$, $-(CH_2)_m-N(R^{15})-CO-$, $-(CH_2)_m-N(R^{15})-CO-(CH_2)_n-$, $-O-(CH_2)_3-N(R^{15})-CO-(CH_2)_m-$, $-CH_2-NH-CO-CH_2-O-$, $-CH_2-NH-CO-CH_2-O-CH(R^{13})-CH_2-$, $-CH_2-NH-CO-CH_2-N(R^{15})-(CH_2)_m-$, $-CH_2-NH-CO-CH_2CH_2-N(R^{15})-(CH_2)_m-$ and

one R being hydrogen and one R being a free valency for compounds of the formulae A-B-A and A-Z-B-Z-A, and both R groups being free valency for compounds of the formulae B-A-B and B-Z-A-Z-B; R^1 is hydrogen, chlorine, C_1–C_4 alkyl, OH or C_1–C_4 alkoxy; R^2 and R^3 independently of one another are H, Cl, C_1–C_{12} alkyl, C_5–C_8 cycloalkyl, phenyl, C_7–C_9 phenylalkyl, OH or C_1–C_{12} alkoxy; R^4 and R^5 independently of one another are H, Cl, OH, C_1–C_{12} alkoxy or C_1–C_{12} alkyl; R^6 is H or CH_3, R^7 is H, O, C_1–C_{12} alkyl, C_3–C_8 alkenyl, benzyl, acetyl or a group $-CH_2-CH(OH)-R^{13}$; R^8 is C_1–C_{12} alkyl, C_3–C_8 alkenyl or C_7–C_9 phenylalkyl; R^9 is a $-CH_2CH=CHCH_2-$;


group;

R^{10} and R^{11} are hydrogen, C_1–C_{12} alkyl, phenyl or benzyl, or R^{10} and R^{11} are together C_4–C_{19} alkylene; R^{12} is H or a free valency; R^{13} is H, CH_3, C_2H_5 or phenyl; X is a



Y is a C_2–C_8 alkylene group; R^{14} is —CH_2— or —$CH(R^{13})$—CH_2—; R^{15} and R^{16} are H, C_1–C_{12}-alkyl, cyclohexyl or benzyl; R^{17} is —O— or —NR^{15}—; R^{18} is C_1–C_{12}-alkoxy, phenoxy or an amino group

m is 0, 1 or 2; and n is 1 or 2.

10. A method of stabilizing a polymer normally subject to deterioration by light against said deterioration which comprises incorporating into said polymer an effective stabilizing amount of a compound according to claim **1**.

4,289,687

FIRE RETARDANT RESIN MOLDED PRODUCT AND PREPARATION PROCESS OF THE SAME

Miyuki Hagiwara, Maebashi, and Yosuke Morita, Takasaki, both of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Jan. 22, 1980, Ser. No. 114,420

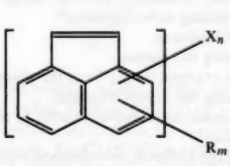
Claims priority, application Japan, Jan. 22, 1979, 54/004802; Jul. 19, 1979, 54/092019

Int. Cl.[3] **C08F** *255/02;* **C08K** *5/03*

U.S. Cl. 260—45.85 E **10 Claims**

1. A process for preparing a fire-retardant and radiation resistant molded resin product, which comprises:

blending a resin selected from the group consisting of polyethylene, polypropylene, polybutene, ethylene-vinyl acetate copolymer, ethylene-ethylacrylate copolymer, ethylene-propylene copolymer, ethylene-propylene-diene copolymer, ethylene-vinylchloride copolymer, ethylene-vinylacetate-graft vinylchloride copolymer, ethylene-propylene-graft vinylchloride copolymer, chlorinated polyethylene, chlorinated polyethylene-graft vinychloride copolymer, polyurethane, polyamide, polyester, acrylic resin, butyl rubber, chloroprene rubber, nitrile rubber, natural rubber, silicone rubber, chlorosulfonated polyethylene, styrene-butadiene rubber, styrene-butadiene-acrylonitrile copolymer, acrylonitrile-styrene copolymer, and polyester-ether elastomer with a halogenated acenaphthylene compound of the formula:



wherein X is chlorine or bromine and R is alkyl, alkoxy or an alkylester of 1 to 4 carbon atoms such that when m is 0, n is an integer of 2 to 8; when m is an integer of 1 to 4, n is an integer of 2 to 7 and $n+m \leqq 8$, and when m is more than 2, R may be the same or different; and, after molding said blend, generating free radicals in said blend.

4,289,688

PROTEIN-BOUND POLYSACCHARIDES

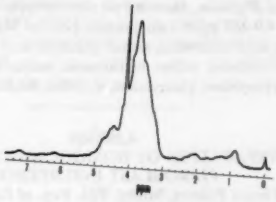
Tetsuya Hotta, Tokyo; Satoru Enomoto, Fujisawa; Chikao Yoshikumi, Kunitachi; Minoru Ohara, Tokyo, and Saburo Ueno, Ichigayadai, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 755,142, Dec. 29, 1976, abandoned. This application May 18, 1979, Ser. No. 40,105

Claims priority, application Japan, Jan. 1, 1976, 51/318

Int. Cl.[3] **A23J** *1/00;* **A61K** *31/71, 31/73, 37/02*

U.S. Cl. 260—112 R **8 Claims**



1. A process for producing protein-bound polysaccharides having an antitumor effect in intraperitoneal or oral administration comprising the steps of:

(a) extracting the mycelia and/or fruit bodies of a species of fungi belonging to the genus Coriolus from the family Polyporaceae and selected from the group consisting of Coriolus versicolor (Fr.) Quel., Coriolus conchifer (Schw.) Pat., Coriolus pargamenus (Fr.) Pat., Coriolus hirsutus (Fr.) Quel., Coriolus biformis (Klotz.) Pat., Coriolus consors (Berk.) Imaz. and Coriolus pubescens (Fr.) Quel. with an aqueous solvent to obtain an extract solution;

(b) concentrating said extract solution after removing the extraction residue therefrom;

(c) subjecting the solution obtained in steb b to salting out by mixing with ammonium sulfate to saturation and collecting the precipitate by separation from the solution and then dissolving the precipitate into water to obtain a solution or subjecting the solution obtained in step b to ultrafiltration to remove low molecular weight substances;

(d) adding ammonium sulfate in an amount corresponding to 25% of its saturation value to the solution from step c to obtain a first precipitate;

(e) separating said first precipitate from the solution;

(f) adding ammonium sulfate in an amount corresponding to 40% of its saturation value to the solution from step e to form a second precipitate;

(g) collecting the second precipitate and then dissolving in water to obtain a solution;

(h) dialyzing the solution from step g to remove salts;

(i) passing the desalted solution from step h through a diethylaminoethylcellulose column and washing the column with water;

(j) eluting said column with an aqueous saline solution to obtain an elutant;

(k) adding ammonium sulfate in an amount corresponding to 40% of its saturation value to the elutant from step j to form a third precipitate;

(l) dissolving said third precipitate in water;

(m) dialysing the solution from step l to remove salts;

(n) spray-drying the desalted solution from step m to obtain the protein-bound polysaccharide.

8. A protein-bound polysaccharide obtained by extraction of a mycelium or fruit body of a Coriolus of Polyporaceae of Basidiomycetes and having a molecular weight within the range of 5,000 to 300,000 as measured with ultra-centrifugation and which gives a positive color reactions characteristic of saccharides with α-naphthol-sulfuric acid, indolesulfuric acid, anthrone-sulfuric acid, phenol-sulfuric acid, and tryptophane-sulfuric acid, a positive ninhydrin color reaction characteristic of amino acids after hydrochloric acid hydrolysis and a posi-

tive color reaction in the Lowry-Folin test characteristic of peptide linkage, said protein-bound polysaccharide having absorption regions, as measured by proton nuclear magnetic resonance spectra, at 0.9±0.1 ppm, 1.2±0.1 ppm, 2.0±0.1 ppm, 4.5±0.1 ppm and 4.7±0.1 ppm, with broad absorption at 3.0–4.4 ppm, said protein-bound polysaccharide having a polysaccharide portion/protein portion ratio within the range of 55/45 to 95/5 provided that the proton strength of the protein portion is at 0.5–2.5 ppm and that of the polysaccharide portion is at 2.5–6.0 ppm, and said polysaccharide portion being composed of β-glucan, showing no absorption attributed to α-glucan at 4.9–6.0 ppm, said protein portion being composed of aspartic acid, threonine, serine, glutamic acid, proline, glycine, alanine, cysteine, valine, methionine, isoleucine, leucine, tyrosine, tryptophane, phenylalanine, lysine, histidine and arginine.

4,289,689

PREPARATION OF HOMOGENEOUS HUMAN FIBROBLAST INTERFERON

Heinz-Jürgen Friesen, Moers, Fed. Rep. of Germany, and Sidney Pestka, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 130,635, Mar. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 62,371, Jul. 31, 1979, abandoned. This application Jun. 19, 1980, Ser. No. 160,889

Int. Cl.[3] **C07C** *103/52;* **A61K** *45/02*

U.S. Cl. 260—112 R **11 Claims**

1. A process for producing human fibroblast interferon as a homogeneous protein which process comprises the following steps in combination:

A. passing an aqueous solution of human fibroblast interferon in an impure state through an affinity chromatography column so as to absorb said interferon onto said column and thereafter eluting said interferon from said column and obtaining said interferon in selected fractions of said eluate in a state of enhanced purity; and

B. passing the selected said interferon fractions obtained in Step A through one or more buffer equilibrated hydrocarbon bonded silica matrix column under high pressure liquid chromatography conditions wherein said hydrocarbon is selected from the group consisting of cyclohexyl, phenyl, diphenyl, octyl, octadecyl and cyanopropyl, to absorb said interferon onto said column and thereafter eluting said interferon from said column with a gradient of an acidic aqueous buffered mixture of water miscible solvents and obtaining interferon as a single distinct peak in selected fractions of said eluate in the state of a homogeneous protein.

4,289,690

PROTEIN PURIFICATION PROCESS AND PRODUCT

Sidney Pestka, North Caldwell, N.J., and Menachem Rubinstein, Rimon, Israel, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 106,644, Dec. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 77,710, Sep. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 62,374, Jul. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 963,257, Mar. 24, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,165

Int. Cl.[3] **C07G** *7/00;* **A61K** *45/02;* **C07C** *103/52*

U.S. Cl. 260—112 R **9 Claims**

1. A process for purifying proteins having molecular weights greater than about 12,000 which process comprises passing an aqueous solution of said protein in an impure state through a buffer equilibrated octyl bonded silica matrix column under high performance liquid chromatography conditions so as to absorb said protein onto said column and thereafter eluting said protein from said column with an increasing gradient of an aqueous water miscible solvent and obtaining said protein in selected fractions of said eluate in a state of enhanced purity.

3. A process for producing interferon as a homogeneous protein which process comprises the following steps in combinations:

A. passing an aqueous solution of interferon in an impure state through a buffer equilibrated octyl bonded silica matrix column under high performance liquid chromatography conditions so as to absorb said interferon onto said column and thereafter eluting said interferon from said column with an increasing gradient of an aqueous, buffered, water miscible solvent and obtaining said interferon in selected fractions of said eluate in a state of enhanced purity;

B. passing the selected interferon fractions obtained in Step A through a buffer equilibrated glyceryl bonded silica matrix column to absorb said interferon onto said column and thereafter eluting said interferon from said column with a decreasing gradient of an aqueous buffered water miscible solvent and obtaining interferon as distinct major peaks in selected fractions of said eluate in a state of enhanced purity;

C. passing the selected fractions of interferon corresponding to one of said distinct major peaks obtained in Step B in buffered solution through a buffer equilibrated octyl bonded silica matrix column under high performance liquid chromatography conditions so as to absorb said interferon onto said column and thereafter eluting said interferon from said column with an aqueous, buffered, water miscible solvent and obtaining interferon as a single distinct peak in selected fractions of said eluate in the state of a homogeneous protein.

4,289,691

METHOD OF OBTAINING INTERMEDIATE PURITY FACTOR VIII

Gail A. Rock, 270 Sandridge Rd., Rockcliffe Park, Canada (K1L 5A2), and Douglas S. Palmer, 17 Front St., Hull, Canada (J8Y 3M4), assignors to The Canadian Red Cross Society, Toronto; Gail Ann Rock, Rockcliffe Park and Douglas Stephen Palmer, Hull, all of, Canada

Continuation-in-part of Ser. No. 123,472, Feb. 21, 1980, abandoned. This application Nov. 26, 1980, Ser. No. 210,385 Claims priority, application Canada, Jan. 18, 1980, 344000

Int. Cl.[3] **C07G** *7/00*

U.S. Cl. 260—112 B **16 Claims**

1. A method of obtaining Factor VIII which comprises

(a) adding heparin to freshly obtained blood plasma collected into a calcium chelating anticoagulant or collecting blood plasma by plasma pheresis using heparin and a calcium chelating anticoagulant;

(b) freezing the plasma;

(c) resolubilizing the plasma;

(d) isolating a cryoprecipitate from the plasma;

(e) resolubilizing the cryoprecipitate;

(f) adding a citrate saline heparin buffer to the resolubilized cryoprecipitate;

(g) incubating the buffered, resolubilized cryoprecipitate at a temperature of from about 0° to about 10° C. for a time in excess of about one hour, whereby Factor VIII present in the cryoprecipitate is insolubilized using heparin precipitable cold insoluble globulin and the resulting Factor VIII rich precipitate also includes cold insoluble globulin;

(h) separating the Factor VIII rich precipitate; and

(i) isolating Factor VIII therefrom.

4,289,692

DERIVATIVES OF A-30912D NUCLEUS

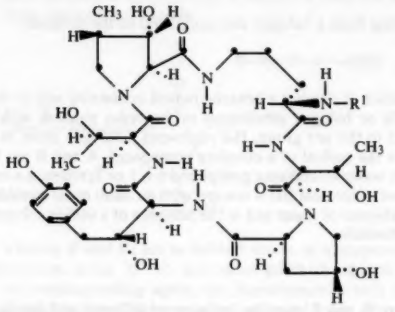
Manuel Debono, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 103,019, Dec. 13, 1979. This application Aug. 25, 1980, Ser. No. 181,035

Int. Cl.[3] C07C *103/52*

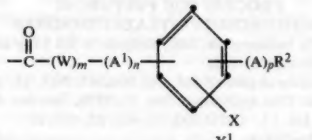
U.S. Cl. 260—112.5 R 40 Claims

1. A compound of the formula:

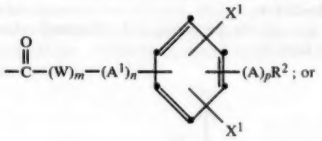


wherein R^1 is a group of the formula:

(a)

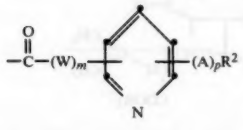


(b)



; or

(c)



wherein A is divalent oxygen, sulfur, sulfinyl, or sulfonyl; A^1 is divalent oxygen, sulfur, sulfinyl, sulfonyl or —NH—; X is hydrogen, chloro, bromo, iodo, nitro, C_1–C_3 alkyl, hydroxy, C_1–C_3 alkoxy, mercapto, C_1–C_3 alkylthio, carbamyl or C_1–C_3 alkylcarbamyl; X^1 is chloro, bromo or iodo; R^2 is hydrogen C_1–C_{18} alkyl or C_2–C_{18} alkenyl; W is C_1–C_{10} alkylene or C_2–C_{10} alkenylene; m, n and p are 0 or 1, but if m=0, n must=0; provided: that the sum of the carbon atoms in the R^2 and W groups must be greater than 4 but cannot exceed 21; that when X is mercapto, A and A^1 cannot be sulfinyl or sulfonyl and that when A and A^1 are sulfinyl or sulfonyl, they must be in equal oxidation states.

4,289,693

AZO DYES HAVING A QUATERNIZED HETEROCYCLIC DIAZO COMPONENT RADICAL AND AN OPTIONALLY SUBSTITUTED ARYLOXYALKYL SUBSTITUENT ON THE AMINO GROUP OF THE COUPLING COMPONENT RADICAL

Beat Henzi, Neuallschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

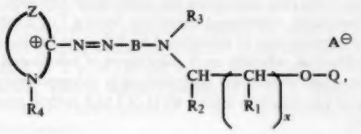
Continuation of Ser. No. 383,782, Jul. 30, 1973, abandoned. This application Dec. 1, 1976, Ser. No. 746,507

Claims priority, application Switzerland, Jul. 31, 1972, 11354/72; Dec. 7, 1972, 17824/72; Feb. 5, 1973, 1618/73

Int. Cl.[3] C07C *107/04;* C09B *44/18, 44/20, 44/10*

U.S. Cl. 260—146 R 49 Claims

1. A compound of the formula



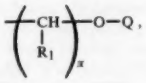
wherein each

R_1 and R_2 is independently hydrogen; alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by halo, alkoxy of 1 to 4 carbon atoms or phenoxy; phenyl or cycloalkyl of 5 to 6 carbon atoms,

R_3 is hydrogen, phenyl, alkyl of 1 to 12 carbon atoms or alkyl of 1 to 12 carbon atoms substituted by halo, alkoxy, cyano, phenyl, phenoxy, alkoxycarbonyl wherein the alkoxy radical has 1 to 4 carbon atoms, alkylcarbonyloxy wherein the alkyl radical has 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, benzoyloxy, —O—CO—$N(Ra)_2$ or —CO—$N(RA)_2$,

wherein each Ra is independently hydrogen or alkyl of 1 to 4 carbon atoms,

R_4 is alkyl of 1 to 8 carbon atoms; alkyl of 1 to 8 carbon atoms substituted by halo, hydroxy, cyano, phenyl, phenoxy, cycloalkyl of 5 or 6 carbon atoms, alkoxy of 1 to 4 carbon atoms or carbamoyl; alkenyl of 2 to 8 carbon atoms; alkenyl of 2 to 8 carbon atoms substituted by halo, hydroxy, cyano, phenyl, phenoxy, cycloalkyl of 5 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms or carbamoyl; alkoxy of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl, phenoxy, cycloalkyl of 5 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms or carbamoyl; cycloalkyl of 5 or 6 carbon atoms; cycloalkyl of 5 or 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms or



is triazolium, benzothiazulium or naphthothiazolium, or a substituted derivative thereof, wherein each substituent is independently alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by phenyl, hydroxy, carbamoyl, cycloalkyl of 5 to 6 carbon atoms, cyano or halo; halo; nitro; cyano; trifluoromethyl; alkoxy of 1 to 4 carbon

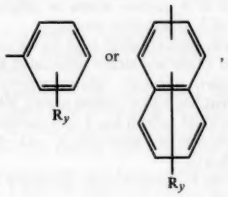
atoms; alkoxy of 1 to 4 carbon atoms substituted by phenyl, hydroxy, carbamoyl, cycloalkyl of 5 or 6 carbon atoms, cyano or halo; cycloalkyl of 5 or 6 carbon atoms; cycloalkyl of 5 or 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halo; phenyl; phenyl substituted by cyano, nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halo; phenoxy; phenoxy substituted by cyano, nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halo; phenylazo; —CO—Ro; —CO—O—Ro; —CO—N-H—Ro; —CO—N(Ro)$_2$; —NH—CO—Ro; —SO$_2$—Ro; —SO$_2$—NH—Ro; —SO$_2$—N(Ro)$_2$ or —NH—SO$_2$—Ro,

wherein each Ro is independently alkyl of 1 to 4 carbon atoms or phenyl,

with the proviso that the azo group is linked to a carbon atom of the ring containing the quaternized nitrogen atom,

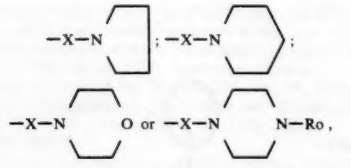
B is phenylene, substituted phenylene having 1 or 2 substituents, naphthylene or substituted naphthylene having 1 or 2 substituents, wherein each substituent of substituted phenylene and substituted naphthylene is independently alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms or halo,

each Q is independently



wherein each

R is independently hydroxy; halo; alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or phenoxy; alkoxy of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or phenoxy; trihalomethyl; trifluoromethyl; cycloalkyl of 5 or 6 carbon atoms; cycloalkyl of 5 or 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; cyano; nitro; phenoxy; naphthyloxy; phenylazo; —CO—Ro; —CO—O—Ro; —CO—N-H—Ro; —CO—N(Ro)$_2$; —O—CO—Ro; —O—CO—N-H—Ro; —O—CO—N(Ro)$_2$; —NH—CO—Ro; —SO$_2$—Ro; —SO$_2$—NH—Ro; —SO$_2$—N(Ro)$_2$; —OSO-$_2$—N(Ro)$_2$;



wherein each

Ro is independently alkyl of 1 to 4 carbon atoms or phenyl, and

X is —CO— or —SO$_2$—, and

y is 0, 1, 2, 3, 4 or 5, each x is independently 1, 2 or 3, and A$^{\ominus}$ is an anion, wherein each halo is independently chloro, bromo or iodo.

4,289,694

PROCESS FOR THE INDUSTRIAL PREPARATION OF WATER INSOLUBLE AZO DYESTUFFS CONTAINING CYANO GROUPS FROM THE CORRESPONDING HALOGEN COMPOUNDS

Gerard L. A. Belfort, Oissel, France, assignor to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed May 23, 1979, Ser. No. 41,658

Claims priority, application France, May 31, 1978, 78 16184

Int. Cl.^{3} C09B *43/00*

U.S. Cl. 260—208 **21 Claims**

1. A process for the manufacture of a cyano azo dye which is insoluble in water and has the formula:

$$(CN)_n—A—N=N—B \quad (I)$$

starting from a halogen azo compound of the formula:

$$(Hal)_n—A—N=N—B \quad (II)$$

in which A denotes a benzene radical containing one or more nitrile or halogen substituents in the ortho position with respect to the azo group, Hal represents a halogen atom, B denotes the radical of a coupling component, A and B are free from water-solubilizing groups and n is 1 or 2, wherein a compound of formula (II) is reacted with an alkali metal cyanide in the absence of water and in the presence of a sulfide solvent of the formula:

$$X—R—S—R'—H \quad (III)$$

where R and R′ may be the same or different and denote an alkylene radical having from 1 to 8 carbon atoms with a straight or branched chain able to contain an —O— or —S— bridge and X represents a hydrogen atom or a hydroxyl group, in the presence of a catalyst constituted by a combination between the sulfide solvent of formula (III) and a cuprous salt.

4,289,695

PROCESS FOR PREPARING 2-CHLOROSULFINYLAZETIDINONES

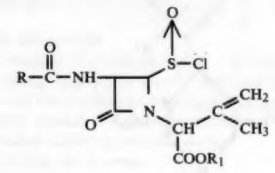
Ta-Sen Chou, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 960,347, Nov. 13, 1978, abandoned. This application Jun. 18, 1979, Ser. No. 49,266

Int. Cl.^{3} C07D *205/08, 405/12, 409/12*

U.S. Cl. 260—239 A **16 Claims**

1. In the process for preparing a 2-chlorosulfinylazetidin-4-one of the formula



wherein

R is hydrogen, C$_1$–C$_3$ alkyl, halomethyl or cyanomethyl; or R is the group R′ wherein R′ is phenyl or phenyl substituted by 1 or 2 substituents selected from the group consisting of C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkoxy, halo, protected hydroxy, nitro, cyano and trifluoromethyl; or R is a group of the formula

R″—O—

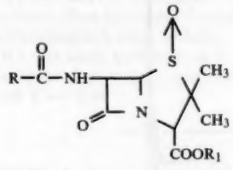
wherein R″ is t-butyl, 2,2,2-trichloroethyl, benzyl, 4-nitrobenzyl or 4-methoxybenzyl; or R is a group of the formula

$R'''(Z)_nCH_2-$

wherein R''' is R' as defined above, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl or 1,4-cyclohexadienyl; n is 0 or 1, and Z is O or S, subject to the limitation that when n is 1, R''' is R'; or R is a substituted aralkyl group of the formula

wherein R''' has the same meanings as defined above and Q is protected hydroxy or protected amino;

and R_1 is a carboxylic acid protecting group, which comprises heating in an inert organic solvent a penicillin sulfoxide ester of the formula



wherein R and R_1 are as defined above, at a temperature between about 75° C. and about 175° C. with an N-chlorohalogenating agent, the improvement which consists of heating said penicillin sulfoxide ester with the N-chlorohalogenating agent in the presence of an organic solvent insoluble, weakly basic cross-linked poly-4-(vinylpyridine) polymer in a ratio by weight of said polymer to penicillin sulfoxide of between about 1:1 and about 1:5, wherein said polymer is cross-linked to between about 1 percent and about 10 percent with a cross-linking agent selected from among the group consisting of divinylbenzene, N,N'-methylenebisacrylamide, N,N'-decamethylenebisacrylamide, N,N-diallylacrylamide, ethylene diacrylate, ethylene dimethacrylate, 1,1,1-trimethylolpropane trimethacrylate, 1,1,1-trimethylolpropane triacrylate, 1,1,1-trimethylolethane triacrylate, 1,1,1-trimethylolethane trimethacrylate, pentaerythritol tetramethacrylate, 1,3,5-triacryloylhexahydro-s-triazine, 1,3,5-trimethacryloylhexahydro-s-triazine, diallyl phthalate, diallyl malonate, diallyl succinate, N,N-diallylpiperazine, tetraallyloxyethane, tetraallylpyromellitate, trivinylcyclohexane, and divinylsulfone.

4,289,696

POLYCYCLIC COMPOUNDS

Terence C. Smale, Epsom Downs, England, assignor to Beecham Group Limited, England

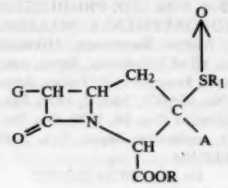
Division of Ser. No. 955,598, Oct. 30, 1978, Pat. No. 4,223,038. This application Feb. 11, 1980, Ser. No. 120,065

Claims priority, application United Kingdom, Dec. 11, 1977, 47201/77

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.2 T **19 Claims**

1. A compound of the formula:



wherein

A is chloro, bromo or iodo;

R_1 is alkyl of 1 to 6 carbon atoms, unsubstituted or substituted with hydroxy, amino, alkanoylamido of 1 to 6 carbon atoms, benzyloxycarbonylamido or p-nitrobenzyloxycarbonylamido; phenyl; or phenyl substituted by one or more members selected from the group consisting of halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, amino, alkanoylamido of 1 to 6 carbon atoms, benzyloxycarbonylamido or p-nitrobenzyloxycarbonylamido;

R is alkyl of 1 to 6 carbon atoms, benzyl, p-nitrobenzyl, p-methoxybenzyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, phthalidyl, phthalimidomethyl, α-ethoxycarbonyloxyethyl or alkanoyloxymethyl of 1 to 6 carbon atoms, and

G is hydrogen, alkyl or alkenyl, said alkyl and alkenyl being unsubstituted or substituted with hydroxy, oxy, methoxycarbonyl, phenyl or phenyl substituted with alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro or halo.

4,289,697

5-SUBSTITUTED 4-HYDROXY-2,3-ALKYLENE THIAZOLIUM SALTS

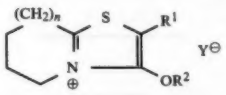
Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 15, 1980, Ser. No. 197,359

Int. Cl.³ C07D *513/04*

U.S. Cl. 260—245.5 **4 Claims**

1. A compound of the formula:



in which

R^1 is phenyl, halophenyl, alkylphenyl of 7 to 10 carbon atoms, nitrophenyl or aminophenyl;

R^2 is hydrogen or alkanoyl of 2 to 4 carbon atoms;

Y is the anion of a pharmaceutically acceptable acid; and

n is one of the integers 1 or 2.

4,289,698

SOLVENT STABLE COPPER PHTHALOCYANINE BLUE PIGMENTS

James D. Stepp, Point Roberts, Wash., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 3, 1980, Ser. No. 109,413

Int. Cl.³ C07D *207/00*; C09B *47/04*

U.S. Cl. 260—314.5 **7 Claims**

1. A process for producing stable copper phthalocyanine blue pigment in the alpha form comprising grinding copper phthalocyanine blue crystals to produce a powder, contacting the powder with chlorine and mixing the chlorinated pigment with sulfuric acid.

4,289,699

PROCESS FOR THE PRODUCTION OF N-(HYDROXYPHENYL) MALEIMIDES

Masayuki Oba; Motoo Kawamata; Hikotada Tsuboi, and Nobuhito Koga, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

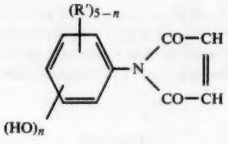
Division of Ser. No. 956,971, Nov. 2, 1978, Pat. No. 4,231,934. This application Oct. 26, 1979, Ser. No. 88,825

Claims priority, application Japan, Nov. 2, 1977, 52-130905; Nov. 4, 1977, 52-131504

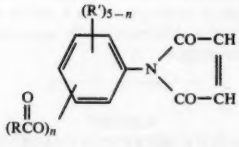
Int. Cl.[3] C07D *207/452*

U.S. Cl. 260—326.5 FM 9 Claims

1. A process for the production of an N-(hydroxyphenyl)-maleimide expressed by the formula:



where R′ stands for H, CH_3, C_2H_5, F, Cl, Br or I and n is 1 or 2, comprising admixing an N-(hydroxyphenyl)-maleimide ester expressed by the formula:



where R stands for an alkyl group having 1 to 7 carbon atoms or a phenyl group, and R′ and n each have the same meaning as indicated above, with at least one oxyacid selected from the group consisting of sulfuric acid, thiosulfuric acid, sulfurous acid, phosphoric acid, metaphosphoric acid and pyrophosphoric acid to dissolve said ester in said oxyacid at a temperature of 0°-150° C., the amount of said ester being within the solubility limit thereof in said oxyacid, and then admixing the resulting mixture with water to hydrolyze the ester and to precipitate said N-(hydroxyphenyl)-maleimide.

4,289,700

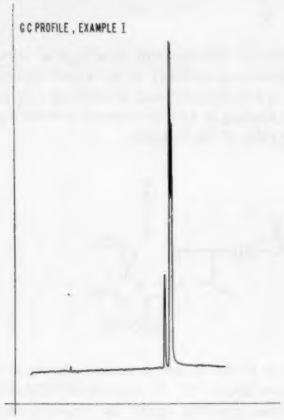
CYCLIC ACETALS OF 2-METHYL-2-PENTENAL AND FOOD FLAVOR USES THEREOF

Takao Yoshida, West Long Branch, and Manfred H. Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

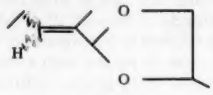
Filed Aug. 24, 1977, Ser. No. 827,253

Int. Cl.[3] C07D *317/10*

U.S. Cl. 260—340.9 R 3 Claims



1. A substantially pure compound having the structure:



wherein the wavy lines represent either a "cis" or "trans" configuration around the carbon-carbon double bond of the ethyl moiety with respect to the dioxolane moiety.

4,289,701

LACTONE SUBSTITUTED ANILINE PREPARATION

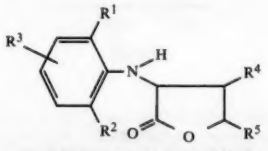
William L. Schinski, San Rafael, and Francis J. Freenor, III, Richmond, both of Calif., assignors to Chevron Research, San Francisco, Calif.

Filed Nov. 13, 1979, Ser. No. 93,765

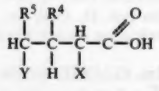
Int. Cl.[3] C07D *307/30*

U.S. Cl. 260—343.6 10 Claims

1. A process for making

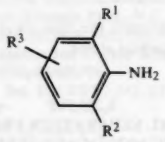


in an overall reaction which comprises contacting



with

-continued



in a reaction zone at a temperature between 20° and 250° C. to obtain a reaction mixture and contacting said reaction mixture with an inorganic base at a temperature between 20° C. and 250° C. in a second part of the overall reaction to thereby obtain the compound of formula I, wherein

R^1 is lower alkyl or hydrogen;

R^2 is lower alkyl or hydrogen;

R^3 is lower alkyl, hydrogen, C_1–C_4 alkoxy, C_1–C_4 halo alkyl, trifluoromethyl, nitro, or halo;

R^4 is lower alkyl, hydrogen, or C_1–C_4 alkoxy;

R^5 is lower alkyl or hydrogen; and

X and Y are halo.

4,289,702

PREPARATION OF ERYTHORBIC ACID AND ASCORBIS ACID 6-FATTY ACID ESTERS

Gordon D. Gruetsmacher, Gales Ferry, and Charles R. Stephens, East Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 75,084, Sep. 13, 1979, abandoned, which is a continuation of Ser. No. 861,506, Dec. 16, 1977, abandoned. This application Jun. 5, 1980, Ser. No. 156,746

Int. Cl.³ C07D *307/62*

U.S. Cl. 260—343.7 **6 Claims**

1. A process for the preparation of a 6-fatty acid ester of erythorbic or ascorbic acid which comprises contacting erythorbic or ascorbic acid with a saturated fatty acid of from about 12 to 18 carbon atoms in a medium consisting essentially of at least about 10 moles of anhydrous hydrogen fluoride per mole of said fatty acid and continuing said contacting until monoesterification is substantially complete.

4,289,703

ANTIBIOTICS

Kevin D. Barrow, Kensington, Australia, and Graham Mellows, London, England, assignors to Beecham Group Limited, England

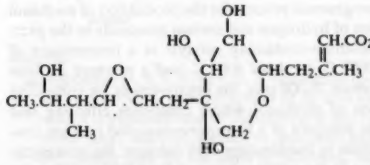
Continuation-in-part of Ser. No. 612,237, Sep. 11, 1975, abandoned, which is a continuation of Ser. No. 444,791, Feb. 22, 1974, abandoned, which is a division of Ser. No. 261,042, Jun. 8, 1972, abandoned. This application Nov. 12, 1976, Ser. No. 741,215

Claims priority, application United Kingdom, Jun. 12, 1971, 27653/71

Int. Cl.³ C07D *309/10*

U.S. Cl. 260—345.8 R **1 Claim**

1. The methyl ester of pseudomonic acid I having the formula:



and being in substantially pure form.

4,289,704

PREPARATION OF GAMMA-PYRONES

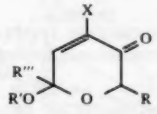
Thomas M. Brennan, Old Lyme; Daniel P. Brannegan, Pawcatuck; Paul D. Weeks, and Donald E. Kuhla, both of Gales Ferry, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 971,897, Dec. 21, 1978, abandoned, which is a division of Ser. No. 869,493, Jan. 16, 1978, Pat. No. 4,147,705, which is a division of Ser. No. 721,885, Sep. 9, 1976, Pat. No. 4,082,717, which is a continuation-in-part of Ser. No. 710,901, Aug. 2, 1976, abandoned. This application Jul. 2, 1980, Ser. No. 164,514

Int. Cl.³ C07D *309/22*

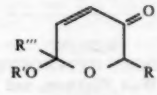
U.S. Cl. 260—345.8 R **2 Claims**

1. A process for preparing a compound of the formula



wherein R is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or benzyl; R′ is hydrogen, alkyl of 1 to 4 carbon atoms or

wherein R″ is methyl, ethyl or phenyl; R‴ is hydrogen or alkyl of 1 to 4 carbon atoms; and X is bromine, or chlorine which comprises contacting a compound of the formula



in a reaction-inert solvent at a temperature of −50° to 50° C. with at least one equivalent of a halogen oxidant selected from the group consisting of chlorine, bromine, bromine chloride, hypochlorous acid, hypobromous acid or mixtures thereof until the reaction is substantially complete.

4,289,705

2-OXABICYCLOOCTANE DERIVATIVE, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 77,539, Sep. 21, 1979, Pat. No. 4,269,862, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Aug. 7, 1980, Ser. No. 176,050

Int. Cl.³ C07D *309/04*

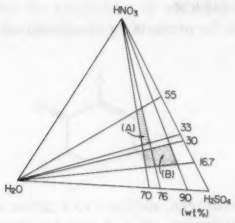
U.S. Cl. 260—345.1 **1 Claim**

1. The compound having the structure:

4,289,706
METHOD FOR PRODUCING 1-NITROANTHRAQUINONE

Akira Fukasawa, Toyonaka; Shinzaburo Masaki, Takarazuka, and Norio Serizawa, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 853,753, Nov. 21, 1977, abandoned. This application Jul. 27, 1979, Ser. No. 61,382
Claims priority, application Japan, Jan. 6, 1977, 52-695
Int. Cl.³ C07C *50/18*
U.S. Cl. 260—369 **6 Claims**



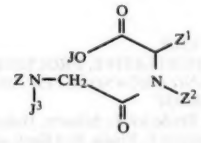
1. A method for producing 1-nitroanthraquinone by nitration of anthraquinone, which comprises reacting anthraquinone at a temperature of 30° to 80° C. with a mixed acid comprising sulfuric acid and nitric acid, the concentration of sulfuric acid being 70 to 76% by weight and the amount of nitric acid being 33 to 55% by weight based on the total weight of sulfuric acid and nitric acid, and then separating the reaction mixture into a crystal portion of 1-nitroanthraquinone and a liquid portion of the mixed acid.

4,289,707
NITROGEN HETEROCYCLES

Albert G. Caldwell, West Wickham, and Norman Whittaker, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Mar. 21, 1978, Ser. No. 888,524
Claims priority, application United Kingdom, Mar. 23, 1977, 12144/77
Int. Cl.³ A61K *31/23*
U.S. Cl. 260—404.5 **7 Claims**

1. A compound of formula (II)



(II)

wherein J is alkyl of 1 to 6 carbon atoms, J^3 is hydrogen or benzyloxycarbonyl, Z is hydrogen or alkyl, one of Z^1 and Z^2 is represented by the group $—CH_2—X—X^1—X^2$ wherein X is $—CH_2—CQ_2—$ in which each Q is independently selected from hydrogen and alkyl or the two Q'S together form alkylene having from four to six carbon atoms;

X^1 is a covalent bond or a straight or branched alkylene chain having 1 to 6 carbon atoms;

X^2 is selected from carboxyl or alkoxycarbonyl; the other of Z^1 and Z^2 is represented by the group $—Y—Y^1—Y^2—Y^3$, wherein Y is $—CR_2—CH_2—$ in which each R is independently selected from hydrogen and methyl;

Y^1 is methylene, methylene substituted by hydroxyl or methylene substituted by hydroxyl and alkyl;

Y^2 is a covalent bond or straight or branched alkylene having 1 to 7 carbon atoms optionally substituted on the carbon adjacent Y^1 by one or two groups each of which is alkyl;

Y^3 is hydrogen

or a salt thereof wherein the term alkyl as it appears above has one to six carbon atoms.

4,289,708
CATALYST METAL SEPARATION FROM SATURATED ALIPHATIC MONOCARBOXYLIC ACIDS

Robert H. Scott; Hubert H. Thigpen, both of Corpus Christi, and Frank Wood, Jr., Houston, all of Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 9, 1979, Ser. No. 65,239
Int. Cl.³ C07C *51/235, 55/07, 53/122, 53/127*
U.S. Cl. 260—413 **6 Claims**

1. A process for separating manganese and copper from organic saturated aliphatic monocarboxylic acids having 3 to 9 carbon atoms which comprises treating said metal-containing organic acids with oxalic acid, in an amount sufficient to precipitate sebstantially all of the copper and manganese as cupric oxalate and manganous oxalate, and separating siad oxalates from said acids.

4. In a process of oxidizing saturated aliphatic aldehydes having 3 to 9 carbon atoms to their corresponding acids using soluble copper and manganese catalysts, the improvement comprising adding sufficient oxalic acid to the metal-containing organic acid product to precipitate substantially all of the copper and manganese to cupric oxalate and manganous oxalate and separating said oxalates from said acids.

5. The process of claim **4** wherein said acid is heptanoic acid.

4,289,709
PREPARATION OF METHANOL FROM SYNTHESIS GAS WITH PROMOTED PALLADIUM CATALYSTS

Steven W. Kaiser, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,407
Int. Cl.³ C07C *27/06, 31/04*
U.S. Cl. 518—714 **7 Claims**

1. In a heterogeneous catalytic process for the production of methanol by the reaction of hydrogen and carbon monoxide in the presence of a palladium-containing catalyst at a temperature of from about 200° C. to about 400° C. and a pressure of from about 150 to about 20,000 psia, the improvement for enhancing the production of methanol which comprises effecting said reaction in the presence of a heterogeneous solid catalyst containing palladium in combination with a metal additive selected from the group consisting of lithium, magnesium, strontium, barium, molybdenum and mixtures thereof.

4,289,710
PROCESS FOR PRODUCING METHANOL FROM SYNTHESIS GAS WITH PALLADIUM-CALCIUM CATALYSTS

Steven W. Kaiser, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,408
Int. Cl.³ C07C *27/06, 31/04*
U.S. Cl. 518—717 **6 Claims**

1. In a heterogeneous process for the production of methanol by the reaction of hydrogen and carbon monoxide in the presence of a palladium-containing catalyst at a temperature of from about 200° C. to about 400° C. and a pressure of from about 150 to about 20,000 psia, the improvement for enhancing the production of methanol which comprises effecting said reaction in the presence of a heterogeneous solid catalyst containing palladium in combination with calcium, the concentration of calcium in the catalyst being at least 0.03 weight percent.

4,289,711
ESTER SYNTHESIS

Grahame R. Lee, Strood, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

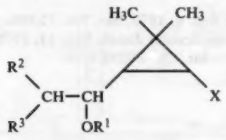
Filed Sep. 3, 1976, Ser. No. 720,347

Claims priority, application United Kingdom, Sep. 5, 1975, 36688/75; Aug. 4, 1976, 32483/76

Int. Cl.³ C07C *143/68*

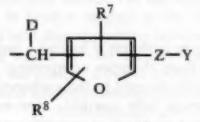
U.S. Cl. 260—456 P **4 Claims**

1. A compound of formula (V)

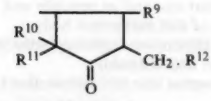


(V)

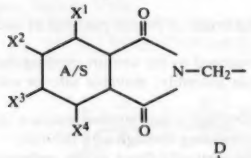
wherein R^1 is the radical derived from a strong organic acid of Formula $R^1.OH$, R^2 and R^3 are the same and are both either Chloro or Bromo and X is nitrile, carboxyl, carbonamide, carbonamide substituted by one or two lower alkyl groups each having 1 to 4 carbon atoms, carbonyl chloride, carbonyl bromide or a group —COOM wherein M is lower alkyl having 1 to 6 carbon atoms, phenylalkyl where alkyl has 1 to 3 carbon atoms, or a group B selected from:



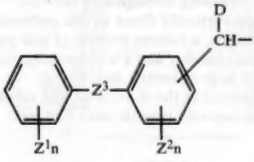
(XIV);



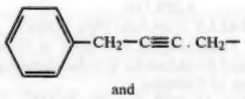
(XV);



(XVI);

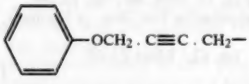


(XVII);



(XVIII);

and



(XIX);

wherein

Z represents O, S, CH_2 or CO, Y represents hydrogen or an alkyl, alkenyl, or alkynyl group or an aryl or furyl group which is unsubstituted or substituted in the ring by one or more alkyl, alkenyl, alkoxy or halogeno groups; R^7 and R^8, which may be the same or different, each represent hydrogen or an alkyl or alkenyl group;

R^9 represents hydrogen or a methyl group;

R^{10} and R^{11}, which may be the same or different, each represent hydrogen or an alkyl group;

R^{12} represents an organic radical having carbon-carbon unsaturation in a position α to the CH_2 group to which R^{12} is attached;

A/S indicates an aromatic ring or a dihydro or tetrahydro analogue thereof;

X^1, X^2, X^3 and X^4, which may be the same or different, each represent hydrogen, chlorine or a methyl group; and

Z^3 represents —CH_2— or —O— or —S— or —CO—; D represents H,CN or —C≡CH; Z^1 and Z^2, which may be the same or different, each represent chlorine or a methyl group; and n is 0, 1 or 2.

4,289,712
TETRACHLORO-BUTYL SECONDARY PHOSPHITES

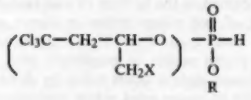
Richard J. Turley, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 80,744, Oct. 1, 1979, Pat. No. 4,247,489, which is a division of Ser. No. 937,033, Aug. 25, 1978, Pat. No. 4,207,272. This application Jun. 30, 1980, Ser. No. 164,737

Int. Cl.³ C07F *9/141*

U.S. Cl. 260—967 **3 Claims**

1. A tetrachloro-butyl secondary phosphite having the formula:



wherein X is a halogen, and R is selected from alkyl of 1 to about 20 carbon atoms, 2-haloalkyl of about 2 to about 8 carbon atoms, alkaryl, aryl, halogenated aryl, and arylalkyl.

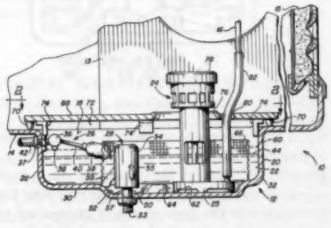
4,289,713
AUTOMATIC FLUSHING AND DRAINING RESERVOIR APPARATUS FOR EVAPORATIVE COOLERS

Adam D. Goettl, 4960 E. Palomino Rd., Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 115,041, Jan. 24, 1980, Pat. No. 4,255,361, which is a continuation-in-part of Ser. No. 7,027, Jan. 29, 1979, Pat. No. 4,192,832. This application Jan. 5, 1981, Ser. No. 222,552

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—27 **12 Claims**



1. An automatic flushing and draining reservoir for an evaporative cooler comprising:

(a) an evaporative cooler including a water distribution plumbing system for carrying water to the upper portion of said cooler and a floor pan for receiving unevaporated water draining by gravity from the upper portion of said cooler, the floor pan of said cooler having an opening formed therein;

(b) a tank depending from the floor pan of said cooler below the opening formed therein, said tank opening upwardly

to receive the unevaporated water from the floor pan, said tank having a cross sectional area which is less than the cross sectional area of the floor pan of said cooler with the opening of said tank being substantially equal to the cross sectional area of the tank and substantially equal to the area of the opening formed in the floor pan of said cooler;

(c) a float controlled shutoff valve means for supplying water from an external source to said tank and maintaining it at a predetermined operating level;

(d) pump means for pumping water from said tank into the water distribution plumbing system of said cooler and allowing the pumped water in the distribution plumbing system to drain back into said tank upon interruption of the operation of said pump means so that this returning pumped water in conjunction with the unevaporated water received from the floor pan of said cooler will cause the water level in said tank to rise from the operating level to a flooded level;

(e) a siphon drain valve mounted in said tank with its water inlet adjacent the bottom thereof and having an elevated water passage zone located between the water operating level and the flooded water level of said tank so that its siphoning action will be initiated upon the water level in said tank reaching the flooded level;

(f) said tank being sized with its water surface area as small as possible as determined by its containment of said siphon drain valve, said pump means and at least the float portion of said float controlled shutoff valve; and

(g) means formed in the bottom of said tank for placing the inlet end of said pump means in direct communication with the water inlet of said siphon drain valve for allowing said pump means to positively stop the siphoning action of said siphon drain valve by drawing the water away from its water inlet when draining of said tank is complete.

4,289,714

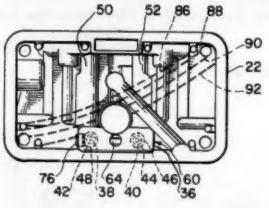
FUEL MANIFOLD FOR OVAL TRACK RACING CARS

Jimmie D. Duncan, 626 E. Chevy Chase Dr., and Ben T. Ryan, 1335 E. Harvard St., both of Glendale, Calif. 91205

Filed Nov. 26, 1979, Ser. No. 97,154

Int. Cl.³ F02M *5/02*

U.S. Cl. 261—34 R **5 Claims**



1. In a carburetor,

a liquid fuel reservoir connected to the carburetor for supplying fuel therefor,

a plurality of spaced identical jets on a horizontal plane adjacent the bottom of the reservoir and having jet ends connected to the reservoir and connected to parts of the carburetor to provide horizontal fuel flow passages directly to the carburetor from the reservoir,

the improvement comprising:

removable encapsulating means surrounding jet ends in said reservoir so that the flow of fuel through said identical jets is generally equalized regardless of the angle of the fuel level,

said encapsulating means having a first opening to said reservoir, and having a flow passage from said first opening to said jets,

said removable encapsulating means is an elongated member extending between and around said jet ends in said reservoir,

said member being formed with a pair of spaced second openings communicating with said flow passage adapted to snap fit on the jet ends so as to be secured thereon.

4,289,715

VARIABLE VENTURI TYPE CARBURETOR

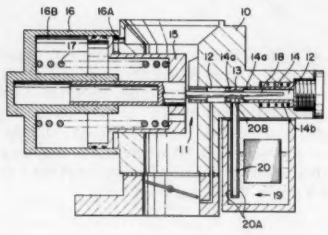
Takaaki Ito, Susono, and Norihiko Nakamura, Mishima, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 6, 1979, Ser. No. 72,996

Claims priority, application Japan, Sep. 11, 1978, 53-111435

Int. Cl.³ F02M *9/06*

U.S. Cl. 261—44 C **16 Claims**



1. Variable venturi type carburetor having a body including an external wall and a float chamber comprising:

a venturi unit vertically formed in the carburetor body;

a horizontal fuel suction hole assembly, one end of which opens in said venturi unit and an opposite end opening in said external wall of said carburetor body;

a plug which blocks the opposite opening in the wall outside of said fuel suction hole assembly;

a tubular member inserted into said fuel suction hole assembly;

a throttle provided inside of the inserted end of said tubular member;

a suction piston opposed to the venturi opening end of said fuel suction hole assembly, movable into or out of said venturi unit;

a tapered needle attached to said suction piston, a tip portion of said needle extending through said throttle;

a fuel suction pipe vertically fitted to the carburetor body beneath said throttle, a bottom portion of said pipe opening into the float chamber and a top portion opening into said fuel suction hole assembly; and

fuel path means formed in the throttle of said tubular member to communicate said throttle with said pipe.

4,289,716

THERMALLY INSULATING TUBES

Hermann U. Voigt, Langenhagen, Fed. Rep. of Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte A.G., Hanover, Fed. Rep. of Germany

Filed Feb. 14, 1979, Ser. No. 12,248

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1978, 2806560

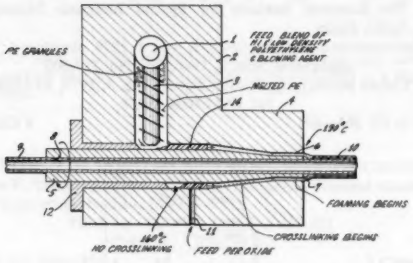
Int. Cl.³ B29D *27/00*

U.S. Cl. 264—45.9 **11 Claims**

1. Method of jacketing a tube with a foamed, thermal insulation, and including providing a thermoplastic resin powder or granulate, conveying and heating the thermoplastic resin powder or granulate in a device such as a screw extruder in order to melt the powder or granulate; feeding the heated thermoplastic melt from the device into a shear head which includes a fast rotating, hollow mandrel for further heating the plastic, the tube passing through the hollow mandrel, the melt being

shaped and discharged from the shear head onto and around the tube as the tube emerges from the mandrel, the improvement comprising:

adding a chemical blowing agent to the thermoplastic melt prior to said feeding step for rendering the melt foamable, said blowing agent reaching a decomposition temperature for subsequently obtaining foaming just prior to the discharge of the foamable, plastic melt onto and around the tube; and



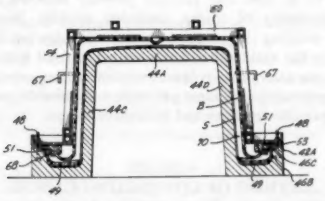
adding a cross-linking agent to the foamable, plastic melt when inside said shear head and at a location in the shear head in which the thermoplastic has a temperature so that it is completely melted, but the temperature of the thermoplastic, as further heated in the shear head, has not yet reached said decomposition temperature of said chemical blowing agent at said location said cross-linking agent causing the plastic to begin cross-linking at a temperature below said decomposition temperature.

4,289,717

METHOD OF MAKING A CUSHIONED BATHROOM ARTICLE

Wayne E. Bortz, Seattle, Wash., assignor to The Soft Bathtub Company, Seattle, Wash.

Filed Oct. 18, 1979, Ser. No. 85,995
Int. Cl.[3] B29D *27/04*; A47K *3/00*
U.S. Cl. 264—46.5 **8 Claims**



1. A method for making a cushioned bathroom receptacle, said method comprising the steps of:

(a) fabricating a base, said base having a wall portion, a floor portion and a peripheral flange portion, said wall portion being closed at one end by said floor portion and being open at an opposite end, and said peripheral flange portion being integral with and extending from the open end of said wall portion;

(b) fabricating a composite flexible polymeric skin by;

(1) spraying a liquid mixture of a resinous material and a volatile carrier therefor on a form having a peripheral surface, a recess and a member having a wall surface and a floor surface, said member centrally projecting from said peripheral surface, said wall surface of said member being generally complementary to said wall portion of said base, said floor portion of said member being generally complementary to said floor portion of said base, said recess surrounding said wall surface of said member and joining said wall surface and said peripheral surface, said recess being generally complementary to said peripheral flange portion of said base, and allowing said resinous material to completely cure to form a first layer of said resinous material;

(2) thereafter spraying a self-foaming flexible skin foam resin on first layer of said resinous material on said form, said resin being applied to said first layer on all of said surfaces of said form in a layer sufficiently thin to prevent substantial foaming of said resin and thereby produce a relatively dense flexible skin foam layer on said first layer of said resinous material, to thereby form said composite flexible polymeric skin, said skin having a first portion overlying said peripheral surface of said form, a second portion overlying said wall surface, a third portion overlying said recess, and a fourth portion overlying said floor surface;

(c) thereafter applying said self-foaming skin foam resin in said recess in an amount sufficient to induce foaming and produce a layer of relatively less dense skin foam in said recess adjacent said third portion of said composite flexible polymeric skin;

(d) assembling said base with a frame having a peripheral frame base, said frame base having a lower surface generally similar in configuration to said peripheral surface of said form and having a supporting framework generally similar in its interior configuration to the outer configurations of said wall portion and said floor portion of said base, by inserting said wall portion and said floor portion of said base into said supporting framework of said frame and securing said base to said frame;

(e) assembling said frame with said form so that said lower surface of said peripheral base is adjacent said first portion of said composite flexible polymeric skin, whereby said base is separated from but closely adjacent to said second, third and fourth portions of said composite flexible polymeric skin to define a cavity with said wall portion of said base being in registration with said second portion of said composite flexible polymeric skin, said flange portion of said base being in registration with said third portion of said composite flexible polymeric layer, and said floor portion of said base being in registration with said fourth portion of said composite flexible polymeric layer;

(f) injecting a flexible foam material in liquid form into said cavity and allowing said foam material to expand throughout said cavity to thereby form a flexible foam between said base and said second and fourth portions of said flexible polymeric layer and between said peripheral flange portion of said base and said layer of relatively less dense flexible skin foam in said recess;

(g) disassembling said skin from said form and disassembling said frame from said base.

4,289,718

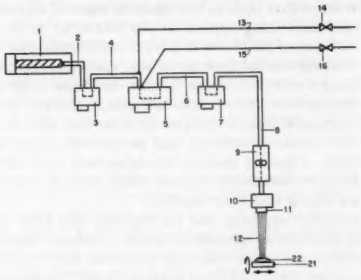
MAT MATERIAL AND METHOD FOR MAKING IT

Balf Vollbrecht, Obernburg, and Karl Ostertag, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 921,715, Jul. 3, 1978, Pat. No. 4,212,915, which is a continuation of Ser. No. 738,986, Nov. 4, 1976, abandoned. This application Nov. 5, 1979, Ser. No. 91,650
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2550070
Int. Cl.[3] B29D *27/00*
U.S. Cl. 264—50 **10 Claims**

1. In a process for the manufacture of a mat material comprising filaments having a plurality of adjacent, uniform, individual, discontinuous cavities which comprises extruding a synthetic polymer melt through a spinneret having a plurality of spinning orifices each having a diameter in excess of about 0.2 mm onto a moving surface located at a distance from the spinneret, the improvement wherein from 0.1 to 0.4 weight %, based on the weight of the melt of a silicone oil, and a gas that

is essentially inert to the melt, or an inert, gas-forming substance are mixed with the melt under conditions whereby the gas or gas-forming substance is largely dissolved in the melt, the melt is extruded in an essentially vertical direction onto a moving plane having a structured surface and located at a



distance of 3 to 20 cm from the spinneret, where the filaments are deposited onto and between elements forming the surface structure of the receiving area and are mutually solidly fused at their points of intersection, following which the resulting mat material is withdrawn after cooling from the moving area.

4,289,719

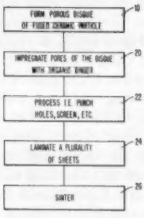
METHOD OF MAKING A MULTI-LAYER CERAMIC SUBSTRATE

Charles M. McIntosh, Orlando, Fla., and Arnold F. Schmeckenbecher, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,482

Int. Cl.[3] **C04B** *39/08*

U.S. Cl. 264—61 **21 Claims**


FORM POROUS BISQUE OF FUSED CERAMIC PARTICLES
IMPREGNATE PORES OF THE BISQUE WITH ORGANIC BINDER
PROCESS I.E. PUNCH HOLES, SCREEN, ETC.
LAMINATE A PLURALITY OF SHEETS
SINTER

1. A method of making a multi-layer ceramic substrate for an integrated circuit device package having internal circuitry comprising:

forming a plurality of porous ceramic bisque sheets by shaping a mixture which includes (1) a powdered ceramic material; (2) a lower melting powdered glass material; and (3) an organic binder material, and subsequently heating the resultant shaped sheet at a temperature less than the sintering temperature of the ceramic material but at least as high as the softening temperature of the glass material, said heating operative to adhere the particles of ceramic material with the glass material and burn off the binder material,

impregnating the pores of said bisque sheets with an organic binder material,

forming openings through said impregnated bisque sheets,

filling said openings with conductive material,

imprinting conductive circuitry patterns on the surface of said impregnated bisque sheets of a conductive material,

assembling said plurality of apertured printed, impregnated bisque sheets into a laminated unit,

sintering said laminated unit to form a unitary laminated structure having an interconnected internal circuitry system.

4,289,720

PROCESS FOR PRODUCING A THERMAL-RESISTANT CERAMIC FIRED BODY

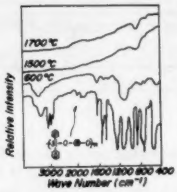
Seishi Yajima; Toetsu Shishido; Kiyohito Okamura; Hideo Kayano, all of Oharai; Josaburo Hayashi, Naga, and Hiroshi Kobayashi, Fuji, all of Japan, assignors to The Foundation: The Research Institute for Special Inorganic Materials, Asahi, Japan

Continuation of Ser. No. 930,079, Aug. 1, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 117,603

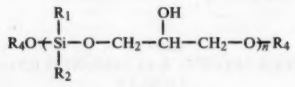
Claims priority, application Japan, Aug. 3, 1977, 52-92584

Int. Cl.[3] **C05B** *35/14*

U.S. Cl. 264—63 **5 Claims**



1. A process for producing a thermalresistant ceramic fired body, which comprises adding an organosilicon polymer having the following structural formula:



wherein R_1 and R_2 are the same or different and represent an alkyl group having a carbon number of not more than 4, or a phenyl group, R_4 represents a hydrogen atom, a trimethylsilyl group, or a triphenylsilyl group, and n is less than 10,000, as an additive to at least one ceramic powder selected from the group consisting of oxides, carbides, nitrides, borides and silicides; molding the resulting mixture in a desired form; and then firing the molded body at a temperature of 800° to 2000° C. under vacuum or in at least one atmosphere selected from the group consisting of inert gas, carbon monoxide gas, carbon dioxide gas, nitrogen gas and hydrocarbon gas.

4,289,721

METHOD OF CONNECTING CABLES

Kojiro Ishise, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 58,396, Jul. 17, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,550

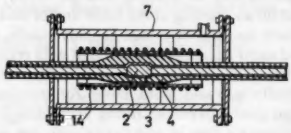
Claims priority, application Japan, Jul. 17, 1978, 53-87530; Aug. 26, 1978, 53-104017; Oct. 23, 1978, 53-130748; May 23, 1979, 54-64515

Int. Cl.[3] **B29C** *6/04*

U.S. Cl. 264—85 **19 Claims**

1. A method of connecting two cables each having an internal conductor comprising the steps of: connecting spaced ends of said conductors with a conductive connector, forming a reinforcing insulation layer over said connector for the conductors of said cables by pouring insulation material in a metal mold at a material pouring rate corresponding to the ratio (Q/t) of an insulation material pouring speed Q (cc/min) to time t (min) required for pouring said insulation material into said metal mold, wherein said ratio is not less than five; said insulation material comprising polyethylene blended with a

crosslinking agent; providing a heat-shrinkable tube on said reinforcing insulation layer by heating said heat-shrinkable



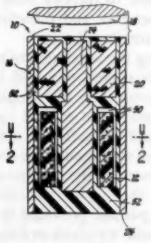
tube to form a cable connection part; and forming said cable connection part by heating while being pressurized in a fluid medium.

4,289,722

METHOD OF POTTING MAGNETIC SPEED PICKUPS

Glen E. Tranbarger, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1980, Ser. No. 173,031
Int. Cl.³ B29C *6/02*
U.S. Cl. 264—102 **3 Claims**



3. A method of potting a magnetic pickup assembly that comprises a housing containing a polymer bonded barium-ferrite magnet comprising the steps of:

heating the pickup assembly to a temperature that equals or exceeds the use temperature for the intended pickup application;

introducing a heated resinous material comprising epoxy resin and hardener into said housing;

evacuating the pickup assembly so that said resinous material impregnates the spaces surrounding said magnet;

curing said resinous material by maintaining the temperature of the pickup assembly at or higher than said use temperature for a period of time sufficient to solidify said material; and

cooling said assembly to permit said magnet to contract, whereby adequate spacing is provided within said pickup assembly to accommodate for thermal expansion and contraction of said magnet.

4,289,723

PROCESS FOR THE PREPARATION OF REGENERATED CELLULOSE FORMED BODIES FROM SOLUTIONS OF CELLULOSE DERIVATIVES IN ORGANIC SOLVENTS

Roberto Leoni, Milan; Alberto Baldini, Garlasco, and Gianfranco Angelini, Buscate, all of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.P.A., Milan, Italy

Filed Jul. 25, 1979, Ser. No. 60,544
Claims priority, application Italy, Jul. 27, 1978, 26175 A/78
Int. Cl.³ C09J *3/08;* D01F *2/28*
U.S. Cl. 264—187 **8 Claims**

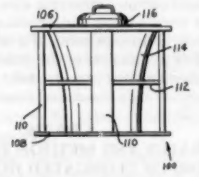
1. A process for the preparation of regenerated cellulose formed bodies from organic solutions of methylol cellulose derivatives having 0.8 or more formaldehyde units per anhydroglucosidic unit, which comprises first precipitating said cellulose derivative in a coagulating bath consisted of the organic solvent for said cellulose derivatives and a cellulose derivative non-solvent, non-regenerating organic liquid selected from the group consisting of alcohols, ethers, esters, aldehydes, ketones, chlorinated organic liquids and nitriles, and subsequently drawing the cellulose derivative body (in a subsequent hot water bath to an extent) between 10% and the maximum value which said cellulose body can withstand without breaking, and regenerating the cellulose in (said hot water bath) one or more aqueous baths consisting essentially of hot water, wherein the drawing and the regeneration occur, at least in part, concurrently.

4,289,724

SIMULATED TREE FURNITURE AND METHOD OF MOLDING SAME

Shirley Baynard, 7878 N. Main St., Apt. 1-N, Jonesboro, Ga. 30236

Filed Dec. 4, 1978, Ser. No. 966,003
Int. Cl.³ B29C *1/02, 3/00*
U.S. Cl. 264—225 **3 Claims**



1. A method of molding simulated tree furniture comprising:

constructing a flexible mold by molding a plastic molding material around actual portions of a tree whereby one surface of the mold is complementary to and corresponds to the bark surface of the tree so that the flexible mold can be used to reproduce the identical tree portions;

constructing a mold frame having a top and a bottom connected together by frame members and a removable mold sleeve such as flexible galvanized metal mounted between said top and said bottom;

placing said flexible mold against the inside surface of said removable mold sleeve so that said one surface corresponding to the bark surface of the tree faces away from the inside surface of said removable mold sleeve;

positioning a removable central core member within said removable mold sleeve leaving a space between said removable central core member and said flexible mold to receive concrete poured therein;

supporting a bracket partially in said space between said removable central core member and said flexible mold on said mold frame;

pouring concrete into the space between said removable central core and said flexible mold;

curing said concrete;

removing said removable central core member and said removable mold sleeve from said mold frame and peeling said flexible mold from said concrete to form hollow simulated tree furniture.

4,289,725

MATERIAL WEB FOR THE MANUFACTURE OF FILTER RODS FOR TOBACCO PRODUCTS AND APPARATUS AND PROCESS FOR PRODUCING SUCH WEB

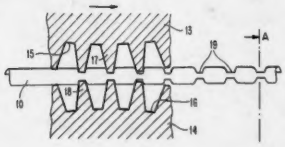
Paul A. Müller, Triesenberg, Liechtenstein, and Hans Muster, Greifensee, Switzerland, assignors to Celfil Company Establishment, Vaduz, Liechtenstein

Continuation of Ser. No. 844,389, Oct. 21, 1977, abandoned. This application Jun. 13, 1980, Ser. No. 159,281

Claims priority, application Switzerland, Aug. 11, 1977, 9888/77

Int. Cl.[3] B31F *1/22;* B21F *1/36*

U.S. Cl. 264—287 8 Claims



1. A process for treating a web of fibrous material to improve its filtering qualities and increase its resistance to lateral crushing when gathered transversely and enclosed in a wrapper to make a filter cord subdividable into filter rods and filter plugs for cigarettes, the web being provided with closely spaced longitudinal corrugations wherein the material has been laterally stretched to loosen and expose fibers, comprising:

advancing the web along a path; and

compressing and compacting the advancing web in successive spaced narrow transverse zones to substantially eliminate the corrugations and produce a denser structure in said zones, said zones being of a width not over about 0.4 mm and of a thickness of the order of about 0.2 mm and being spaced apart not over about 2.0 mm.

4,289,726

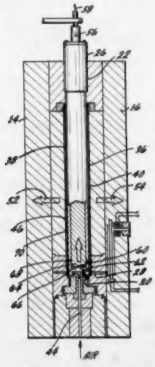
APPARATUS AND METHOD FOR INJECTION MOLDING OF ELONGATED HOLLOW PLASTIC CONTAINER WALLS

Joseph B. Potoczky, 8975 Burke Ave., South Gate, Calif. 90280

Filed Jul. 2, 1979, Ser. No. 53,962

Int. Cl.[3] B29F *1/14*

U.S. Cl. 264—318 4 Claims



1. The method of injection molding an elongated hollow plastic article having its internal sidewalls parallel to itself through to form an article having a cylindrical interior shape of arbitrary cross-section, said method comprising:

a. providing a pair of mold halves which, when brought together, define a cavity closed at one end, said mold halves providing (i) a sprue through which molten plastic material may be injected into the cavity under pressure, and (ii) an opening at the other end of said cavity through which one end of a core extends axially, the sidewall of said mold halves being provided with reentrant means for defining a projection on said molten article extending radially into said mold halves for restraining said article from axial movement during unmolding;

b. disposing a core in said cavity with one end extending in close fit relation through said opening in the mold halves, said core having its sidewalls parallel and defining the interior of said article, and spaced from the sidewalls of said cavity;

c. disposing a core centering element between the innermost cavity-defining walls of the mold halves;

d. when said core has been disposed in said cavity, causing molten plastic to be injected under high pressure through said sprue to fill the space between the core sidewalls and the sidewalls defining said cavity, said plastic being of a type which sets into a rigid substantially non-extendable member upon cooling;

e. cooling said injected molten plastic to a temperature approximately just below the softening point of said injected plastic to thereby form said article, and while at such temperature and therefore while article is slightly yieldable, simultaneously

f. commencing the separation of said mold halves from each other while maintaining said reentrant means in contact with said projection and simultaneously applying a force directed axially out of said opening and against the restraint of said projection to withdraw said core from said thus formed article and also simultaneously providing air under pressure at the innermost end of said thus-formed article in the cavity and air-under-pressure admitted through a passage provided in said centering element to whereby said air-under-pressure is forced between the outer end and sidewalls of said core and the thus-formed article to forceably expand the article radially outward and cause a small air gap to be established between said core and said article to thereby facilitate the withdrawal of the core from the same;

g. completing the separation of the mold halves;

h. and, ejecting the thus-formed article from such mold half as it may have remained in, after the mold halves have been completely separated.

4,289,727

METHOD FOR EXTRUSION OF TUBULAR FILMS

F. John Herrington, Jr., Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,351

Int. Cl.[3] B29D *7/24*

U.S. Cl. 264—514 7 Claims

1. A method for producing blown crystalline high density polyethylene film comprising the steps of:

melt extruding a thin inner tubular layer of said high density polyethylene;

coextruding a thinner outer tubular layer of higher-melting thermoplastic at a temperature at least 50° F. above the high density polyethylene melting point;

inflating the tubular coextruded film utilizing an encapsulated fluid;

cooling the tubular film to solidify the outer higher melting thermoplastic layer before solidifying the inner tubular layer; and externally supporting the molten high density polyethylene layer while permitting relaxation of molecular orientation before solidification of the inner tubular film;

thereby reducing the tendency for machine direction rupturing or splitting of the high density polyethylene under stress.

4,289,728

IMPROVEMENTS IN METHODS OF STERILIZATION

John L. Peel, and William M. Waites, both of Norwich, England, assignors to National Research Development Corp., London, England

Filed Jan. 3, 1980, Ser. No. 109,317
Claims priority, application United Kingdom, Jan. 11, 1979, 1091/79
Int. Cl.[3] A61L *2/10;* B65B *55/08*
U.S. Cl. 422—24 18 Claims

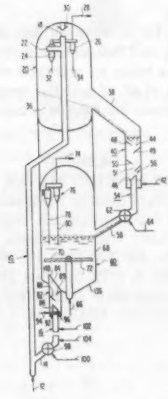
1. A method of sterilizing food packaging which comprises treating a microorganism at the surface of the packaging with an ultraviolet irradiated solution of hydrogen peroxide, the wavelength of the ultraviolet radiation being wholly or predominantly below 325 nm and the concentration of the hydrogen peroxide being at least 0.01% and no greater than 10% by weight, whereby the microorganism is rendered non-viable by synergism between the radiation and the hydrogen peroxide.

4,289,729

BIASED DEGASSER FOR FLUIDIZED BED OUTLET

George D. Myers, and Paul W. Walters, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jul. 26, 1979, Ser. No. 61,117
Int. Cl.[3] F27B *15/08;* F26B *17/10;* B01J *8/28*
U.S. Cl. 422—144 19 Claims



1. A solids transport system wherein particulate solids are transferred to a conduit from the dense phase of a fluidized bed within a vessel larger than said conduit, said system comprising:

an upwardly extending solids outlet conduit with an open upper end for receiving a flow of solids from said dense phase bed;

a degasser means for reducing the amount of gas entrained by said solids flow into said conduit, said degasser means including a substantially vertical curvilinear wall extending upward from said upper conduit end and cut on the bias to form a solids outlet rim beveled at an angle in the range of 5° to 85° to the vertical and having a low side abutting said upper conduit end and a high side forming an extension of said upper conduit end, said curvilinear wall adjoining and extending around at least the major portion of said upper conduit end and said high side being submerged within said dense phase bed; and,

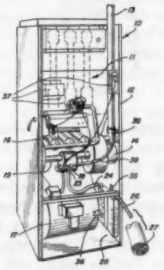
inlet means for introducing particulate solids into said vessel and means for maintaining said solids in a fluidized condition without imparting substantial swirling motion to said dense phase bed such that said flow of solids into said upper conduit end consists essentially of solids transferred through said outlet rim by the fluid head of said dense phase bed, said upper conduit end being at a depth in said dense phase bed sufficient under said fluidized conditions to cause said solids to have a tendency to lose fluidization within said conduit or across said conduit end in the absence of said degasser means, the high side of said rim being spaced below said inlet means by at least one-half the depth of said dense phase bed, and the upper end of said outlet conduit being located within about one conduit diameter of the bottom of said dense phase bed.

4,289,730

FURNACE WITH FLUE GAS CONDENSATE NEUTRALIZER

Ronald S. Tomlinson, Nashville, Tenn., assignor to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Mar. 26, 1980, Ser. No. 133,981
Int. Cl.[3] B01D *53/34;* F01N *3/10*
U.S. Cl. 422—178 10 Claims



1. In a domestic furnace having means for burning fuel resultingly producing gaseous products of combustion and means for exhausting the gaseous products of combustion wherein acidic condensate may result from cooling of gaseous acid-forming components in the gaseous combustion products, the improvement comprising:

means for neutralizing the acidic condensate;

means for conducting acidic condensate from the exhausting means to the neutralizing means; and

discharging means for discharging the neutralized condensate from the neutralizing means.

4,289,731

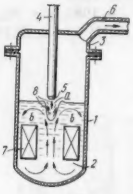
APPARATUS FOR PYROLYSIS OF HYDROCARBON STARTING PRODUCTS

Elena D. Khmelevskaya, Yaroslavskoe shosse, 142, kv. 106, Moscow; Grigory I. Dvoskin, Mytischi, Sharapovsky proezd, 18, kv. 4, Moskovskaya oblast; Vladislav A. Kablikov, Sretensky bulvar, 6/1, kv. 122, Moscow; Zinovy F. Chukhanov, ulitsa D. Ulyanova, 3, kv. 40, Moscow; Vadim M. Volny, ulitsa Butlerova, 34, korpus 1, kv. 29, Moscow; Tamara N. Mukhina, Festivalnaya ulitsa, 15, korpus 3, kv. 44, Moscow; Genrikh L. Stolyar, Kievskaya ulitsa, 18, kv. 51, Moscow; Olga E. Volnaya, ulitsa Butlerova, 34, korpus 1, kv. 29, Moscow, and Nikolai F. Kuptsov, ulitsa Shafeeva, 18, kv. 25, Ufa, all of U.S.S.R.

Filed Jun. 28, 1977, Ser. No. 811,137
Int. Cl.[3] C10G *9/04, 9/34, 9/42*
U.S. Cl. 422—206 8 Claims

1. In an apparatus for pyrolysis of hydrocarbon starting products, casing means having an upper hollow interior gas space and accommodating in its interior below said gas space a heat carrier which is adapted to be placed in a molten condition, first jet supply means extending downwardly into said gas space and having an open bottom discharge end situated in close proximity to an upper surface of said heat carrier for introducing into said casing means a jet of hydrocarbon start-

ing products for creating with said jet a hydrodynamic crater in the upper surface of said molten heat carrier and for directing the jet of hydrocarbon starting products into the bottom of the thus-created crater to flow upwardly in said crater from the bottom toward the top thereof in the form of a thin layer along the crater surface in a manner providing an intensive transfer of heat from the heat carrier to the starting products, so that pyrolysis products leave the crater and emerge into the gas space over the heat carrier, heating means operatively connected with said casing means for placing said heat carrier in said molten condition, said heating means comprising a second jet supply means for supplying a gaseous heating agent to the upper surface of said heat carrier for creating therein a crater at said upper surface into which the jet of gaseous heat-



ing agent flows for transferring heat to the heat carrier to place the same in said molten condition, baffle means carried by said casing means in the interior thereof between the first and second jet supply means and extending to a depth which is only slightly below the upper surface of the heat carrier for dividing the space over the heat carrier into a pyrolysis zone with which a first discharge pipe means communicates and a zone for receiving gaseous heating agent, said first discharge pipe means being operatively connected to said casing means and communicating with said upper gas space for receiving said pyrolysis products and discharging them from said casing means and second discharge pipe means communicating with the gaseous heating agent receiving zone for removing gaseous heating agent therefrom.

4,289,732

APPARATUS FOR INTIMATELY ADMIXING TWO CHEMICALLY REACTIVE LIQUID COMPONENTS

John R. Bauer, Baytown; Robert W. Byars, LaPorte, and Robin L. Grieve, Houston, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 969,221, Dec. 13, 1978, abandoned. This application Feb. 22, 1980, Ser. No. 123,797

Int. Cl.[3] **B01F** *5/20*

U.S. Cl. 422—224 **5 Claims**

1. An apparatus adapted to achieve intimate mixing of two liquid components which enter into reaction one with the other substantially immediately after they are brought together, which apparatus comprises in combination:

a substantially cylindrically shaped mixing chamber provided with side walls, and exit means at one end thereof and a plurality of inlet means at the other end thereof;

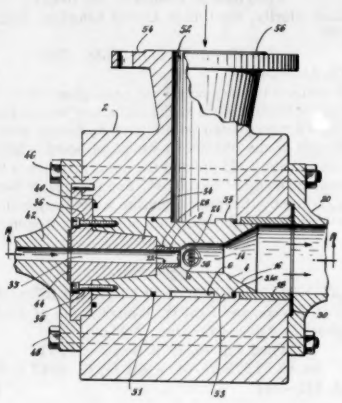
a first jet inlet means disposed substantially symmetrically in the end of the said mixing chamber remote from said exit means and having the nozzle of said jet means projecting into said mixing chamber and being directed substantially along the longitudinal axis thereof;

at least two additional jet inlet means disposed in the side walls of said mixing chamber at the end thereof remote from said exit means, the nozzles of said jets projecting through the side walls into said mixing chamber and being directed towards the longitudinal axis of said mixing chamber and in a plane substantially at right angles to said axis;

means for introducing a first liquid component under pressure through said first jet inlet means;

means for introducing a second liquid component under pressure simultaneously through each of said additional jet inlet means; and

means for conducting mixed liquid components from said exit means to a subsequent reaction zone; each of said first and said additional jet inlet means being provided with



shaping means for forming said liquid components into flat spray patterns; said first jet inlet means and said additional jet inlet means being so arranged relative to each other that the paths of all of said flat sprays formed from said liquid components intersect at a common locus.

4,289,733

APPARATUS FOR MAKING SILVER HALIDE GRAINS

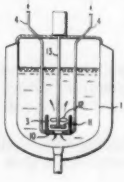
Hirokazu Saito; Keiichi Suzuki; Masayuki Shimizu, and Junji Miyahara, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 641,714, Dec. 17, 1975. This application Mar. 9, 1979, Ser. No. 19,062

Claims priority, application Japan, Dec. 17, 1974, 49-145381

Int. Cl.[3] **B01F** *5/04, 7/00*

U.S. Cl. 422—227 **3 Claims**



1. Apparatus for producing silver halide grains by a process which comprises introducing a water soluble silver salt solution and a water soluble halide solution for purposes of reaction to form silver halide grains into a vertically disposed mixing chamber whose interior is filled with an aqueous colloid solution, which mixing chamber is within a reaction vessel which is also filled with said aqueous colloid solution, comprising:

the mixing chamber comprising a polygonal-pillar casing, the upper and lower ends of which are open, and which is provided with

(i) first agitator means in the lower portion thereof to achieve a first agitation which quickly mixes and reacts both reactant liquids; and

(ii) second agitator means in the upper interior portion thereof to achieve a second agitation which quickly expels the silver halide grains formed upwardly into the

aqueous colloid solution in the reaction vessel outside said mixing chamber; and

(iii) means for controlling the rate of revolution of said first agitator means and said second agitator means independently of each other.

4,289,734

APPARATUS FOR CONTACTING SOLIDS WITH A LIQUID

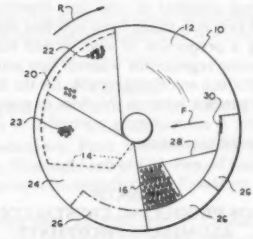
Andre Longuet, Bethune, France, assignor to Fives-Cail Babcock, Paris, France

Filed Oct. 6, 1980, Ser. No. 193,925

Claims priority, application France, Oct. 4, 1979, 79 24674

Int. Cl.³ B01D *11/02;* **C13D** *1/12*

U.S. Cl. 422—272 **6 Claims**



1. An apparatus for contacting solids with a liquid, which comprises

(a) a drum rotatable about a substantially horizontal axis in a direction of rotation and having a cylindrical side wall and two closed end walls, the drum walls defining an interior chamber, the solids being delivered into the interior chamber through one of the end walls and the liquid being delivered thereinto through the other end wall,

(b) a screw conveyor arranged in the interior chamber for continuously conveying the solids from the one end wall towards the other end wall upon rotation of the drum while the liquid flows countercurrently thereto, the screw conveyor having helical turns affixed to the cylindrical side wall of the drum and defining a helical passageway for the solids between the helical conveyor turns,

(c) means for raising the solids and for draining the solids during rotation of the drum, said means being spaced along the helical passageway and dividing the passageway into a series of compartments, each of the solids raising and draining means including

(1) a grating receiving the solids and raising the received solids while liquid is drained through the grating and then permitting the drained solids to fall into a succeeding one of the compartments, and

(2) an imperforate partition trailing the grating in the direction of rotation of the drum, the partition having an inner end adjacent the axis of the drum and defining a chamber receiving the liquid drained from the solids with the adjacent side wall of the drum and the helical screw turns, and

(d) a passageway interconnecting each of said chambers with the compartment upstream of the chamber in the direction of movement of the solids from the one to the other end wall, the passageways extending along the side wall of the drum, and each passageway communicating with the upstream compartment it feeds through openings in a trailing part thereof in the direction of rotation of the drum and through orifices in a leading part thereof in the direction of drum rotation, the leading part adjoining the imperforate partition of the solids raising and draining means,

(1) a perforate dike defining the orifices, the dike being arranged in the leading part and being disposed approximately in the median plane of the compartment and extending transversely to the axis of the drum.

4,289,735

PROCESS FOR THE PRODUCTION OF ALUMINUM CHLORIDE

Hans P. Mueller, Magden; Hanspeter Alder, Flurlingen, both of Switzerland, and Gerhard Zhuber-Okrog, Rheinfelden, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 1, 1980, Ser. No. 117,462

Claims priority, application Switzerland, Feb. 16, 1979, 1512/79; Feb. 16, 1979, 1513/79

Int. Cl.³ C01F *7/56, 7/60*

U.S. Cl. 423—136 **9 Claims**

1. A continuous process for producing aluminum chloride from aluminum oxide bearing substances in a fluidized bed comprising:

(a) preparing a fluidized bed of an aluminum oxide bearing substance having a range in particle size of from about 10 to 120 microns and a bulk density of from about 0.2 to 0.9 g/cm^2 and a chemically and physically inert solid dilution agent having a range of particle size of from about 60 to 200 microns and a bulk density of from about 0.4 to 1.8 g/cm^2 wherein the solid dilution agent is in an amount equal to 10 to 90 weight percent of the total weight of the fluidized bed;

(b) heating said bed at a temperature of up to 800° C.; and

(c) reducing and chlorinating said fluidized bed with a reducing and chlorinating gas or mixtures thereof at a gas flow rate of from about 2 to 30 cm/sec whereby the solid dilution agent has a larger average particle size and bulk density than said aluminum oxide bearing substance as a result of the chemical conversion of said aluminum oxide bearing substance into aluminum chloride.

6. A continuous process for producing aluminum chloride from aluminum oxide bearing substances coated with carbon in a fluidized bed comprising:

(a) preparing a fluidized bed of an aluminum oxide bearing substance coated with carbon having a range in particle size of from about 10 to 120 microns and a bulk density of from about 0.2 to 0.9 g/cm^2 and a chemically and physically inert solid dilution agent having a range of particle size of from about 60 to 200 microns and a bulk density of from about 0.4 to 1.8 g/cm^2 wherein the solid dilution agent is in an amount equal to 10 to 90 weight percent of the total weight of the fluidized bed;

(b) heating said bed at a temperature of up to 800° C.; and

(c) chlorinating said fluidized bed with a chlorinating gas or mixtures thereof at a gas flow rate of from about 2 to 30 cm/sec.

4,289,736

FILTERING OF PRECIPITATING SILICA

Jean M. Lalancette, Sherbrooke, Canada, assignor to Universite de Sherbrooke, Quebec, Canada

Filed Aug. 31, 1979, Ser. No. 71,175

Claims priority, application Canada, Oct. 18, 1978, 313713

Int. Cl.³ C01F *5/00, 5/30, 5/38, 5/40*

U.S. Cl. 423—158 **7 Claims**

1. A process for recovering a water-soluble magnesium salt from a reaction mixture containing a water-soluble magnesium salt, silica, and metal salt impurities comprising reacting the magnesium oxide of an aqueous slurry of asbestos tailings with a mineral acid, there being employed sufficient asbestos tailings that the reaction mixture contains at least 5 percent by weight of asbestos tailings in excess of the stoichiometric amount required for the reaction of the magnesium oxide contained in the asbestos tailings with the mineral acid said excess asbestos tailings being present and recovering the magnesium salt in solution by filtration to eliminate silica and metal salt impurities, the excess asbestos tailings in the reaction mixture facilitat-

ing the filtration of the precipitated silica in forming a mat on the membrane of the filter, the mat being permeable to the solution and retaining the silica and metal salt impurities.

4,289,737

CATALYTIC REACTIONS

Gary J. K. Acres, and Robert M. Hutchings, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 916,817, Jun. 16, 1978, abandoned, which is a continuation of Ser. No. 463,143, Apr. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 71,131, Sep. 10, 1970, abandoned. This application Aug. 1, 1979, Ser. No. 62,903

Claims priority, application United Kingdom, Sep. 16, 1969, 45545/69

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.[3] **B01D** *53/36*

U.S. Cl. 423—245 **1 Claim**

1. In a process for the removal of methane from a gas containing the same, by oxidation to carbon dioxide and water wherein said gas is passed with oxygen through a catalyst bed in which the catalyst comprises a porous refractory support having a platinum group metal deposited thereon, said oxidation involving bringing said gas to its ignition temperature followed by combustion of said gas in the presence of said catalyst, the improvement comprising utilizing, as the catalyst, one which consists essentially of an inert rigid unitary porous refractory ceramic honeycomb having deposited upon the surfaces which come into contact with the said gas a first layer of a catalytically active high surface area refractory metal oxide, a major proportion of which is selected from oxides of at least one of the metals of Group II, III and IV of the Periodic Table having atomic numbers not exceeding 40, and a second metallic layer deposited upon said first layer consisting essentially of an alloy of 35% by weight rhodium and 65% by weight platinum whereby the ignition temperature of the gas is reduced when compared with otherwise identical catalysts wherein the second metallic layer is (a) 100% platinum, (b) 100% rhodium or (c) alloys of 5% rhodium and 95% platinum; 20% rhodium and 80% platinum; or 50% rhodium and 50% platinum, the reduced temperature being in the range of 300°–325° C.

4,289,738

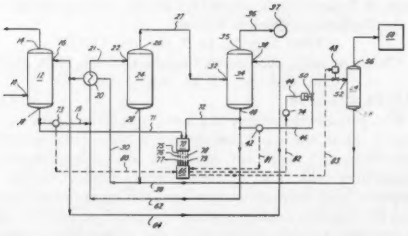
PROCESS FOR REMOVING H_2S FROM SOUR GASES WITH GENERATION OF A CLAUS FEED GAS

Roscoe L. Pearce, and Charles W. Martin, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1980, Ser. No. 171,210

Int. Cl.[3] **B01D** *53/34*

U.S. Cl. 423—228 **4 Claims**



1. A process for treating a sour gas to prepare a fuel gas with relatively low amounts of hydrogen sulfide, and simultaneously prepare (1) a side stream of relatively pure carbon dioxide and (2) a side stream of a gas suitable for the feed to a Claus process having the required H_2S/CO_2 ratio which comprises

(A) feeding a gas containing CO_2 and low amounts of H_2S to a first amine absorber containing an aqueous amine solution to produce a first off gas useful as a fuel gas containing lower amounts of H_2S, a major portion of the CO_2 and a first rich amine,

(B) feeding said rich amine loaded with H_2S and CO_2 from said first amine absorber to a first amine regenerator wherein said amine is regenerated to produce a lean amine and a second off gas containing essentially CO_2 and relatively large amounts of H_2S and said lean amine is recycled back to said first absorber,

(C) feeding said second off-gas to a second amine absorber to produce a third off-gas containing substantially pure CO_2 and a second rich amine,

(D) feeding said second rich amine loaded with H_2S from said second absorber to said first regenerator together with said first rich amine from said first absorber, and

(E) feeding a proportion of said second rich amine to a second amine regenerator wherein said amine is regenerated to produce an off gas suitable for the feed of a sulfur recovery process wherein the flow to said second amine regenerator is automatically controlled to provide a suitable off gas composition.

4,289,739

METHOD OF PRODUCING CRYSTALLINE SODIUM ALUMINUM PHOSPHATE

John S. Chiang, Mercerville; Theodore F. Munday, Kendall Park, and Joseph M. Ilardi, North Brunswick, all of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 26, 1979, Ser. No. 106,634

Int. Cl.[3] **C01B** *25/26*

U.S. Cl. 423—306 **17 Claims**

1. In the method of manufacturing crystalline acidic sodium aluminum phosphate of the formula:

$$NaAl_3H_{14}(PO_4)_8.4H_2O$$

by contacting a reactive sodium compound and a reactive trivalent aluminum compound with aqueous phosphoric acid, the sodium and aluminum compounds being in stoichiometric proportions to provide one sodium atom for each three aluminum atoms and the phosphoric acid being in excess of the amount required to react with all of said sodium and aluminum compounds, and concentrating the resulting solution to effect crystallization of the sodium aluminum phosphate, the improvement of separating the crystals of sodium aluminum phosphate from the resulting viscous crystallization mixture by rapidly diluting said mixture with water in the absence of added organic solvent while maintaining vigorous agitation to produce a liquid suspension of said crystals in aqueous phosphoric acid and immediately recovering the crystals from the aqueous phosphoric acid.

4,289,740

CRYSTALLINE ZEOLITE HP

John H. Estes, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 713,457, Aug. 11, 1976, abandoned. This application Nov. 7, 1979, Ser. No. 92,162

Int. Cl.[3] **C01B** *33/28*

U.S. Cl. 423—328 **33 Claims**

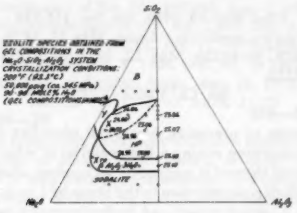
1. The process for preparing sodium zeolite HP which comprises:

a. forming an aqueous mixture of sodium aluminosilicate having a composition sufficient to establish a ratio of silicon atoms to aluminum atoms of between about 0.25 and about 1.0;

b. maintaining said aqueous mixture at hydrothermal conditions including a pressure above 20,000 psig (ca. 138 MPa)

and a temperature of 150°–350° F. (65.6°–176.7° C.) for at least three hours; and

c. recovering crystalline zeolite comprising sodium zeolite HP as the resulting solid product.



17. A synthetic crystalline sodium aluminosilicate zeolite, having a lattice constant of about 25.01 A –25.0 A.

4,289,741
PROCESS FOR THE PRODUCTION OF HYDROGEN CYANIDE

Carl Voigt, Rodenbach; Peter Kleinschmit, Hanau, and Eberhard Walter, Wiesbaden, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,358

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1979, 2913925

Int. Cl.³ C01C *3/02*

U.S. Cl. 423—376 **13 Claims**

1. In a process for the production of hydrogen cyanide or hydrocyanic acid from liquified gas and ammonia according to the conditions of the hydrocyanic acid-methane-ammonia process in a reaction zone, the improvement comprising employing in place of methane a hydrocarbon consisting essentially of propane or at least one butane or a mixture of propane and at least one butane the gaseous mixture consisting essentially of the propane and/or butane, ammonia and hydrogen to provide an atomic ratio of carbon to nitrogen to hydrogen of 1:1:7.1 to 1:1.33:13 at the beginning of the reaction and separating the hydrogen cyanide from the reaction gas mixture.

4,289,742
CARBON BLACK RECOVERY

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 31, 1979, Ser. No. 44,147

Int. Cl.³ C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—450 **5 Claims**

1. A process for filtering solids from carbon black smoke produced in a carbon black furnace by the pyrolysis of hydrocarbon oil under conditions forming a hot smoke having a temperature above 2200° F. which comprises:

(a) quenching said hot smoke removed from said furnace to a temperature of about 2000° F. or below by injecting into it recycle smoke subsequently to be described;

(b) cooling said hot smoke further by indirect heat exchange to a temperature of about 700° F. or lower;

(c) passing said hot smoke, cooled in (b), to a cyclone separation zone to remove a substantial portion of the carbon black solids present as product for further processing as desired;

(d) removing carbon black smoke substantially reduced in solids content from said cyclone separation zone and then passing same through a filtration zone on filtering cycle containing a bed of aggregate filtering medium to further remove solids therefrom;

(e) withdrawing off-gas substantially free of carbon black solids from (d);

(f) passing at least a portion of said off-gas in (e) to a filtration zone on regeneration cycle containing aggregate filtering medium and carbon black solids under conditions to substantially remove said carbon black solids; and

(g) recycling said off-gas containing carbon black solids removed in (f) to (a) as quench to reduce the temperature of said hot smoke.

4,289,743
DOUBLE VENTURI CARBON BLACK REACTOR SYSTEM

Theodore A. Ruble, deceased, late of Fort Worth, Tex. (by Eulalia B. Ruble, executrix), assignor to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.

Division of Ser. No. 812,345, Jul. 1, 1977, Pat. No. 4,213,939. This application Sep. 12, 1979, Ser. No. 74,741

Int. Cl.³ C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—450 **12 Claims**

1. A method for the production of carbon black in a reactor of the type having a reaction tunnel of generally circular cross-section and varying diameter, said tunnel including a combustion zone, a reaction zone and a quench zone in contiguous axial alignment, which method comprises the steps of:

introducing a fluid fuel and oxidant gas into said combustion zone for combustion therein to produce hot combustion product gases;

flowing said hot combustion product gases downstream from said combustion zone into said reaction zone;

introducing hydrocarbon feedstock into said hot combustion product gases in said reaction zone for reaction therewith to produce carbon black;

flowing said admixed hydrocarbon feedstock and combustion product gases downstream through said reaction zone;

passing said admixed combustion product gases and feedstock through first and second venturi flow constrictions disposed in said reaction zone and spaced longitudinally from each other;

flowing said combustion product gases, feedstock and carbon black into said quench zone;

quenching the reactions in said quench zone with a quench fluid; and

separating the carbon black product from off gases downstream from said quench zone.

4,289,744
MATERIAL AND METHOD TO DISSOCIATE WATER

Eugene R. Anderson, Wills Point, Tex., assignor to Horizon Manufacturing Corporation, Wills Point, Tex.

Continuation-in-part of Ser. No. 85,374, Oct. 16, 1979, and a continuation-in-part of Ser. No. 68,749, Aug. 23, 1979, and a continuation-in-part of Ser. No. 902,708, May 4, 1978, Pat. No. 4,182,748, and a continuation-in-part of Ser. No. 902,705, May 4, 1978, Pat. No. 4,207,095. This application Jan. 7, 1980, Ser. No. 110,218

The portion of the term of this patent subsequent to Jan. 6, 1997, has been disclaimed.

Int. Cl.³ C01B *1/07, 13/02*

U.S. Cl. 423—579 **31 Claims**

1. A material for the generation of hydrogen and oxygen from water without spontaneous combustion of the resultant evolved hydrogen which comprises an amalgam of an alkali metal, mercury and aluminum, wherein the atomic weight ratio of alkali metal to mercury is from about 1:100 to about 100:1 and the atomic weight ratio of alkali metal to aluminum is from about 1:100 to about 100:1, intimately admixed with a catalytically active alloy of nickel and at least one element selected from the group consisting of germanium, antimony, gallium, thallium, indium, and bismuth.

16. A process for generating hydrogen and oxygen from water without spontaneous combustion of the resultant hydrogen which comprises contacting water with an amalgam of an alkali metal, mercury and aluminum, wherein the atomic

weight ratio of alkali metal to mercury is from about 1:100 to about 100:1 and the atomic weight ratio of alkali metal to aluminum is from about 1:100 to about 100:1, intimately admixed with a nickel containing alloy in a catalytically effective amount.

4,289,745

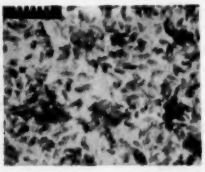
PIGMENTS STABLE AT HIGH TEMPERATURES

Arvind S. Patil, Wyoming, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 70,196, Aug. 27, 1979, abandoned. This application Apr. 28, 1980, Ser. No. 144,735

Int. Cl.³ C01G *41/00*

U.S. Cl. 423—594 **9 Claims**



1. A temperature-stable spinel in the form of acicular particles having a length of 0.01 to 0.13 micron and consisting essentially of oxygen, iron, and at least one metal, said spinel corresponding to the formula

$$XFe_2O_4$$

wherein X is said other metal, said other metal being one selected from the group consisting of Cu, Ca, Cd, Co, Ba, Sr, and Mn.

6. A method of making a pigment having good stability at high temperatures, said method consisting essentially of the steps of

forming a first aqueous solution consisting essentially of water, a soluble ferrous salt, and at least one other salt, said salt being a soluble salt of a non-ferrous metal selected from the group consisting of copper, calcium, cadmium, cobalt, barium, strontium, manganese, and lithium, said ferrous salt and said non-ferrous salt being present in said solution in proportions such that the respective quantities of iron and other metal which are present will yield, when said solution is so adjusted in pH as to cause precipitation, the formation of a substantial quantity of a precipitate oxidizable to a spinel of the formula XFe_2O_4, or YFe_5O_8 in which X is a metal selected from the group consisting of Cu, Cd, Ca, Co, Ba, Sr, and Mn, and Y is Li,

mixing with said first aqueous solution a second aqueous solution to form a reaction mixture, said second solution containing a substantial proportion of a soluble alkalizing compound selected from the group consisting of the carbonates, bicarbonates, and hydroxides of the alkali metals, the said second solution being used in such quantity and the said first and second solutions being in such a state of dilution that there results upon said mixing the formation of a precipitate in the form of particles of sub-micron size, the liquid phase of said reaction mixture being as a result of such precipitation substantially completely depleted in its content of lithium ions and metal ions having a valence greater than one;

oxidizing the said precipitate to form a spinel in aqueous solution;

then heating said aqueous solution having said spinel therein to a temperature of from about 75° to 100° C.; and

recovering said spinel.

4,289,746

PROCESS FOR PREPARATION OF MICACEOUS IRON OXIDE

Masanori Hayakawa, and Satoshi Nishimura, both of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed May 19, 1980, Ser. No. 151,538

Claims priority, application Japan, May 22, 1979, 54/62219; May 22, 1979, 54/62220; May 22, 1979, 54/62221; May 22, 1979, 54/62222

Int. Cl.³ C01G *49/06*

U.S. Cl. 423—633 **22 Claims**

1. A process of preparing hexagonal plate-like crystals of α-Fe_2O_3, comprising mixing a first material of which a principal component thereof is magnetite, an aqueous alkali solution having an alkali concentration in the range of 1 to 20 N, and an oxidizer, in a closed vessel and hydrothermally treating the resultant mixture at a temperature of from about 100° to 400° C. for a time sufficient to effect formation of hexagonal plate-like crystals of α-Fe_2O_3.

4,289,747

IMMUNOLOGICAL DETERMINATION USING LECTIN

Albert E. Chu, San Mateo, Calif., assignor to E-Y Laboratories, Inc., San Mateo, Calif.

Filed Dec. 26, 1978, Ser. No. 972,696

Int. Cl.³ G01N *33/48;* **G01T** *1/00;* **A61K** *43/00*

U.S. Cl. 424—1 **48 Claims**

1. A method for the determination of one component of an immunological conjugate in a fluid sample comprising the steps of

(a) forming an immunological conjugate reaction product including said one component from a fluid sample immunologically bound to its corresponding component, a bound label compound, and a bound lectin, said lectin being bound to said corresponding component,

(b) contacting said reaction product with insolubilized sugar selectively and reversibly reactive with said bound lectin to reversibly bind the reaction product through the lectin to the insolubilized sugar,

(c) separating the insolubilized sugar-bound lectin product from the remainder of said reaction mixture, and

(d) determining the amount of label compound in either said insolubilized sugar-bound lectin product or said remainder as a measure of the quantity of said one component in said sample.

4,289,748

ULTRASENSITIVE ENZYMATIC RADIOIMMUNOASSAY METHOD

Curtis C. Harris, Bethesda; Robert Yolken, Laurel, and Ih-Chang Hsu, Rockville, all of Md., assignors to United States of America, Washington, D.C.

Filed May 31, 1979, Ser. No. 44,260

Int. Cl.³ G01N *33/48;* **G01T** *1/00;* **G01N** *33/54*

U.S. Cl. 424—1 **20 Claims**

1. A method of quantitatively measuring the concentration of an immunosystem reactant comprising:

(a) preparing a solid substrate;

(b) selectively adhering the immunosystem reactant to said substrate;

(c) binding an enzyme-conjugated antibody to said reactant;

(d) reacting a radiolabelled indicator with said enzyme-conjugated antibody thereby producing a radiolabelled product and an unlabelled product;

(e) separating said radiolabelled product(s) from unreacted indicator; and

(f) measuring the extent of reaction by radioactive counting said radiolabelled product, said counting yielding a quantitative measurement of the concentration.

4,289,749

POLYMERIC DIFFUSION MATRIX CONTAINING PHENYLPROPANOLAMINE

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned, and Ser. No. 47,084, Jun. 11, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,009

Claims priority, application Japan, Aug. 14, 1979, 54/103459

Int. Cl.[3] A61L *15/03;* A61K *31/79*

U.S. Cl. 424—28 10 Claims

1. A self-supporting polymeric diffusion matrix for the sustained release of phenylpropanolamine in order to transdermally deliver said phenylpropanolamine to a patient and provide said patient with a bronchodilator and nasal decongestant effect, said matrix comprising from about 2 to about 60% of a polar plasticizer, from about 6 to about 20% by weight polyvinylalcohol, from about 2 to 10% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of phenylpropanolamine to provide a sustained release of said phenylpropanolamine over a prolonged period.

4,289,750

THERAPY OF CONDITIONS WHICH MAY BE ASSOCIATED WITH ALTERED RENAL FUNCTION AND DOSAGE FORMS THEREFOR

Klaus F. Kopp, Aschlkofener Str. 4, D-8017 Ebersberg, and Joachim W. Helbig, Traubinger Str. 23, D-8132 Tutzing, both of Fed. Rep. of Germany

Filed Oct. 15, 1979, Ser. No. 85,066

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1978, 2845059

Int. Cl.[3] A61K *33/00, 33/06, 33/14*

U.S. Cl. 424—33 22 Claims

1. A method of treating a subject suffering from abnormal distribution and retention of body fluids and retention products which is as a result of altered renal function, which comprises orally administering to a subject in need of such treatment, a therapeutically effective amount of an oral dosage form of a pharmaceutically acceptable alkaline acting substance adapted to release sodium and bicarbonate ions in the small intestine of the subject and being capable of increasing patient plasma bicarbonate level to a value in excess of that prior to treatment, the therapeutically effective amount being sufficient to substantially correct metabolic acidosis and increase urine production and clearance of retention products.

4,289,751

EFFERVESCENT ENTERIC-COATED FORMULATION OF SOLUBLE FORM OF ERYTHROMYCIN AND THERAPEUTIC USE THEREOF

John J. Windheuser, Lawrence, Kans., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 53,363, Jun. 29, 1979, abandoned. This application Mar. 17, 1980, Ser. No. 131,183

Int. Cl.[3] A61K *9/46, 9/36, 31/71*

U.S. Cl. 424—35 10 Claims

1. A pharmaceutically acceptable effervescent enteric-coated tablet for orally delivering therapeutic levels of erythromycin to a warm-blooded animal, which comprises a tableted admixture of:

(a) an antibiotic effective amount of a non-toxic pharmaceutically acceptable salt of erythromycin which is readily soluble in the intestines;

(b) a non-toxic pharmaceutically acceptable inert diluent; and

(c) a non-toxic pharmaceutically acceptable effervescent couple acid and base; and

(d) a non-toxic pharmaceutically acceptable enteric coating maintained over the tableted admixture of (a), (b), and (c) above.

4,289,752

COSMETIC COMPOSITIONS CONTAINING N-ALKYLACRYLAMIDE OR N-ALKYLMETHACRYLAMIDE BASED COPOLYMERS

Claude Mahieu, Paris, and Christos Papantoniou, Epinay-sur-Seine, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 783,632, Apr. 1, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,623

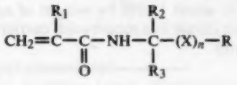
Claims priority, application Luxembourg, Apr. 6, 1976, 74707; Jul. 12, 1976, 75371

Int. Cl.[3] A61K *7/11, 7/043, 31/78*

U.S. Cl. 424—47 11 Claims

1. A hair setting lotion comprising in a hydroalcoholic solution a copolymer which is the polymerization of:

(a) a water-insoluble monomer of the formula



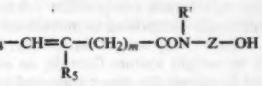
wherein:

R represents alkyl having 1–10 carbon atoms,

R_1, R_2 and R_3 each independently represent hydrogen or methyl,

n=0 or 1 and when n=1, X represents oxygen, and

(b) a water soluble monomer of the formula



wherein

R′ represents hydrogen or methyl,

Z represents alkylene having 1–6 carbon atoms or alkylene having 1–6 carbon atoms and substituted by 1–2 hydroxymethyl groups,

m is 0 or 1,

when m is 0, R_4 is hydrogen or —COR_6 wherein R_6 is OH or —NH—R_7, wherein R_7 is hydrogen or —Z—OH wherein Z has the meaning given above, and R_5 is hydrogen or —CH_3, and

when m is 1, R_4 is hydrogen and R_5 is —COR_6 wherein R_6 has the meaning given above,

said copolymer having a molecular weight between 1,000 and 500,000, and being present in an amount between 0.3 and 6 percent by weight of said lotion.

4,289,753

CALCULUS-INHIBITING METHOD AND COMPOSITIONS

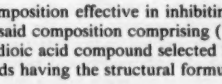
David R. Dyroff; Gary F. Graf; Keun Y. Kim, all of St. Louis, Mo., and Walton F. Suchanek, Jr., Belleville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 4, 1977, Ser. No. 784,188

Int. Cl.[3] A61K *9/68*

U.S. Cl. 424—48 7 Claims

1. An oral composition effective in inhibiting formation of dental calculus, said composition comprising (1) a bis(carboxyalkoxy)-butanedioic acid compound selected from the group consisting of acids having the structural formula:



wherein R is hydrogen or lower normal alkyl and each R can be the same as or different from any other R in said formula, and pharmaceutically acceptable salts of said acids and (2) a

carrier suitable for use in the oral cavity, said compound being present in said composition in amount and concentration sufficient to substantially inhibit formation of dental calculus, said composition being selected from the group consisting of oral hygiene products and chewing gums.

4,289,754

ZINC DERIVATIVES AND THEIR USE IN MOUTHWASH COMPOSITIONS

Dadi J. Dhabhar, Norwalk, Conn., and Nutan B. Shah, New Rochelle, N.Y., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Nov. 3, 1980, Ser. No. 203,520
Int. Cl.[3] A61K *7/16, 7/18, 7/24*
U.S. Cl. 424—52 **8 Claims**

1. A mouthwash composition comprising about 0.01 to about 1.0% by weight of an anticaries effective fluoride compound and about 0.1 to about 15.0% by weight of an ammonium or alkali metal zinc citrate in a mouthwash carrier suitable for use in the oral cavity.

4,289,755

STABLE MOUTHWASH COMPOSITIONS CONTAINING ZINC AND FLUORIDE COMPOUNDS

Dadi J. Dhabhar, Norwalk, Conn., assignor to Richardson-Vicks Inc., Wilton, Conn.

Filed Nov. 3, 1980, Ser. No. 203,634
Int. Cl.[3] A61K *7/16, 7/18, 7/24*
U.S. Cl. 424—52 **7 Claims**

1. A stable mouthwash composition containing zinc and fluoride compounds comprising a mouthwash carrier, from about 0.1 to about 15% by weight zinc citrate, from about 0.01 to about 1% by weight sodium fluoride, an amount of citric acid sufficient to solvate the zinc citrate and an amount of an alkali compound sufficient to adjust the pH of the mouthwash composition to a pH within the range of pH 6.0 to 7.2.

4,289,756

PHYSIOLOGICAL PREPARATION CONTAINING LOADED CELLS OF EXPANDED VOLUME IN SUSPENSION, FOR PREFERENTIAL ACCUMULATION IN SPLEEN AND LIVER

Ulrich Zimmermann, Jülich; Günter Pilwat, Niederzier; Karin Bock, Aachen, and Hermann J. Buers, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,570
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656746
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.
Int. Cl.[3] A61K *37/48, 43/00, 35/14*
U.S. Cl. 424—101 **2 Claims**

1. A process for preparing a mass of loaded cells suspended in a solution which cells by their loading are provided with material intended for chemical or physical interaction with substances present outside the cells, comprising the steps of suspending living animal blood cells selected from the group consisting of erythrocytes, lymphocytes, thrombocytes and leucocytes, and having cell membranes, in a cell-compatible solution, increasing the permeability of the cell membranes by the effect of osmotic pressure or by the effect of an electric field, or both, incorporating loading material selected from the group consisting of medicaments and radionuclides into the cells by passage of said materials from a cell-compatible solution through the membranes of increased permeability, restoring the original permeability of the membranes by healing up the membranes by regeneration effect, then separating the cells from the solution in which they were suspended and putting them for preservation in suspension in a physiological solution, said process incorporating the improvement consisting in that:

in the step of incorporating loading material into the cells from a cell-compatible solution, there is provided in the cell-compatible solution, and therefrom incorporated into the cells, a medicament or a radionuclide intended for and capable of chemical or physical interaction with substances present in the spleen or liver of an animal body and having a destructive effect on the cell membranes by interaction therewith that would lead to premature destruction of the cell membranes in the absence of agents inhibiting such effect, also an osmotically active substance compatible with the cell membranes and having the property of changing the volume of the cells without releasing their contents and thereby causing the loaded cells to differ so greatly from the original cells used in the step of incorporating loading material thereinto, that when the loaded cell suspension in a physiological solution, as prepared by the process, is injected into the bloodstream of an animal body, the loaded cells are treated as foreign bodies and are separated from the blood and broken down by the system of body organs composed of the spleen and liver and their contents are liberated in said organs, and also providing in said cell-compatible solution and therefrom incorporating into the cells and additional material selected from the group consisting of proteins and sugars which is capable of interacting with the material having a destructive effect on the cell membranes, by the formation of hydrogen bridge-bonds or covalent bonds therewith, so as to prevent reaction with the membranes without impairment of the intended effect on substances present in the liver or spleen, said additional material being provided in said cell-compatible solution used in said material incorporating step in such dosing, that after the performance said incorporation step and performance of the step of restoring the original semi-permeability of the loaded cells, the interaction of materials in the loaded cells with the cell membranes will be prevented for a predetermined period of time.

4,289,757

METHOD FOR TREATING INFLAMMATION

E. Myles Glenn, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 882,298, Feb. 28, 1978. This application Nov. 28, 1979, Ser. No. 98,157
Int. Cl.[3] A61K *35/00, 31/70, 31/71, 31/43*
U.S. Cl. 424—120 **13 Claims**

1. A method of treating inflammation comprising administration to the epidermis or areas reached by rectal or vaginal suppositories to mammals suffering from an inflammatory condition not associated with a microbial component an effective dose for alleviating inflammation and its accompanying edema and erythema of an antibiotic selected from the group consisting of:

Polyamido Streptomycin
Streptomycin
Penicillin-O
Streptomycin-Dehydro
Novobiocin
Nystatin
Lincomycin
Streptolydigin
Clindamycin

and their pharmaceutically acceptable salts.

4,289,758

LIQUID BIOCIDAL COMPOSITIONS COMPRIING A MIXTURE OF SILVER IONS AND SODIUM PECTATE

James W. Van Leuven, Duarte, Calif., assignor to Aquatain Partnership, Arcadia, Calif.

Continuation of Ser. No. 75,979, Sep. 17, 1979, which is a division of Ser. No. 776,776, Mar. 11, 1977, Pat. No. 4,184,974, which is a continuation-in-part of Ser. No. 693,622, Jun. 7, 1976, abandoned, which is a continuation of Ser. No. 470,629, May 16, 1974, abandoned. This application Aug. 18, 1980, Ser. No. 178,755

The portion of the term of this patent subsequent to Jan. 22, 1997, has been disclaimed.

Int. Cl.[3] A01N *59/16;* C11D *3/48*

U.S. Cl. 424—132 5 Claims

1. A biocidal composition comprising:

sterile distilled water substantially free of alkaline earth cations, halide ions and strong acid anions containing:

sodium polypectate in the range of from about 100 to 400 parts per million;

silver ion in the range of from about 13 to 250 parts per million;

glycerine in the range of from about 4 to 8% by weight; and

sufficient water soluble base to maintain a pH in the range of from about 7.2 to 7.8.

4,289,759

IMMUNOREGULATORY DIKETOPIPERAZINE COMPOUNDS

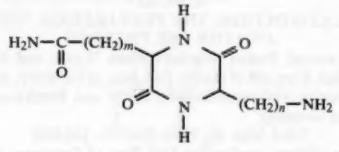
George Heavner, Flemington; Foe-Siong Tjoeng, Neshanic Station, and Gideon Goldstein, Short Hills, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jun. 23, 1980, Ser. No. 162,228

Int. Cl.[3] A61K *37/00;* C07C *103/52;* A61K *31/495;* C07D *241/04*

U.S. Cl. 424—177 7 Claims

1. A chemical compound of formula:



and optical isomers and pharmaceutically acceptable acid m is 1 and n is addition salts thereof, wherein m is 1 or 2 and n is 3 or 4.

4,289,760

23-KETO DERIVATIVES OF C-076 COMPOUNDS

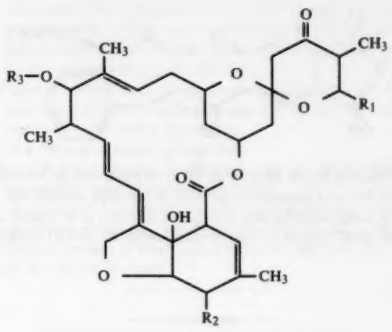
Helmut H. Mrozik, Matawan; John G. MacConnell, Westfield, both of N.J., and August J. Kempf, Staten Island, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 2, 1980, Ser. No. 146,725

Int. Cl.[3] A61K *31/71, 31/335;* C07H *17/08;* C07D *313/00*

U.S. Cl. 424—181 6 Claims

1. A compound having the formula:



wherein

R_1 is iso-propyl or sec-butyl;

R_2 is methoxy, hydroxy, lower alkanoyloxy or substituted lower alkanoyloxy wherein the substituent is hydroxy, phenoxy or mono-, di- or tri-halo; and

R_3 is hydrogen, α-L-oleandrosyl, 4′-(α-L-oleandrosyl)-α-L-oleandrosyl, 4″-lower alkanoyl-4′-(α-L-oleandrosyl)-α-L-oleandrosyl, 4″-substituted lower alkanoyl)-4′-(α-L-oleandrosyl)-α-L-oleandrosyl wherein the substituent is hydroxy, carboxy, phenoxy or mono-, di- or tri-halo; and

the 4″- and/or 5-trisubstituted silyloxyacetyl, acetyl, trifluoroacetyl, trichloroacetyl, chloroacetyl, hydroxyacetyl, carboxyacetyl, and phenoxyacetyl protected derivatives thereof.

6. A composition useful for the treatment of parasitic infections in animals which comprises an inert carrier and an effective amount of a compound of claim 1.

4,289,761

COMBINATION OF 5-OXA-17-PHENYL-PGF$_{1\alpha}$'S ESTROGENIC COMPOUNDS FOR MENSES INDUCTION

John W. Wilks, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

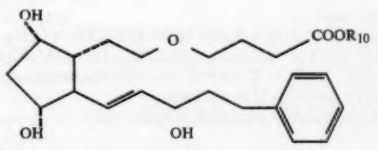
Filed Aug. 6, 1980, Ser. No. 175,466

Int. Cl.[3] A01N *45/00*

U.S. Cl. 424—240 8 Claims

1. A method for inducing menses in a female primate which comprises concomitantly administering to said primate an amount effective to induce menses of

(1) a prostaglandin of the formula III



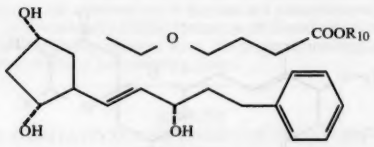
wherein R_{10} is hydrogen, or alkyl of from one to 12 carbon atoms, or a pharmacologically acceptable cation; and

(2) a compound having estrogenic activity;

said combination being administered in a total dosage of from 0.1 to 50.1 mg per kg of body weight, having between 0.1 and 50 mg of the prostaglandin and between 0.001 and 0.09 mg per kg of body weight of the estrogenic compound.

2. A pharmaceutical composition comprising

(1) a prostaglandin of the formula III



wherein R_{10} is hydrogen, alkyl of from one to 12 carbon atoms or a pharmacologically acceptable cation; and

(2) a compound having estrogenic activity, in a weight ratio of with respect to said prostaglandin of 10:9 to 50,000:1.

4,289,762

10-(1,2-PROPADIENYL) STEROIDS AS IRREVERSIBLE AROMATASE INHIBITORS

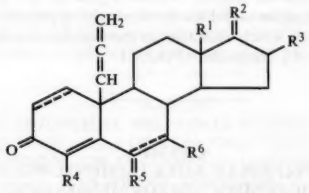
Brian W. Metcalf, Mason, and J. O'Neal Johnston, Cincinnati, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jun. 27, 1980, Ser. No. 163,453

Int. Cl.³ A61K *31/56, 31/58*

U.S. Cl. 424—242 **23 Claims**

1. Compounds having the formulae



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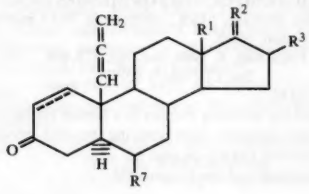
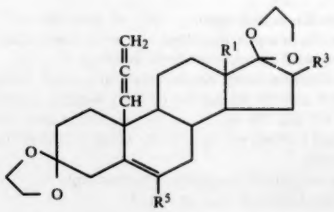


II

wherein ═══ represents a single or a double bond; R^1 is CH_3 or C_2H_5; R^2 is (H)(OR^8) or O; R^3 is H or C_{1-3} alkyl; R^4 is H or OR^8; R^5 is H_2, O or (H)(C_{1-3} alkyl); R^6 and R^7 are each independently H or C_{1-3} alkyl; and R^8 is H or C_{1-4} alkanoyl.

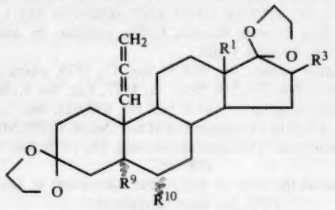
20. Compound having the formulae

III

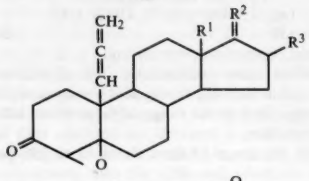


-continued

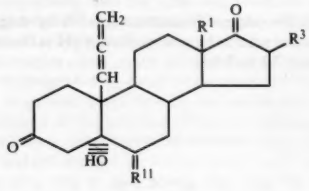
IV



V



VI



wherein R^1 is CH_3 or C_2H_5; R^2 is (H) (OR^8) or O; R^3 is H or C_{1-3} alkyl; R^5 is H, or C_{1-3} alkyl; R^8 is H or C_{1-4} alkanoyl; R^9 and R^{10} together are >O, or R^9 is OH and R^{10} is C_{1-3} alkyl; and R^{11} is (H)(OH) or O.

22. A method of treating a normal or pathological condition mediated by estrogen production and responsive to inhibition of estrogen production, which comprises administering to a subject having said condition a therapeutically effective aromatase inhibiting amount of a compound of claim **1**.

4,289,763

NOVEL CORTICOIDS, THE PREPARATION THEREOF AND THE USE THEREOF

Henry Laurent; Rudolf Wiechert; Hans Wendt, and Joachim-Friedrich Kapp, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

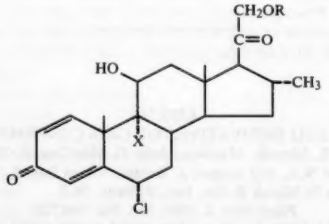
Filed May 19, 1980, Ser. No. 150,826

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920726

Int. Cl.³ C07J *5/00*

U.S. Cl. 424—243 **13 Claims**

1. A corticoid of the formula



wherein

X is fluorine or chlorine and

R is hydrogen, C_{1-6} alkanoyl, benzoyl or —OCO—A—COOH

wherein

A is a carbon-to-carbon bond or a C_{1-6} hydrocarbon chain, or when

R is —OCO—A—COOH, the physiologically acceptable salts thereof with a base.

11. A method of achieving corticoidal effects in a patient in need of such treatment comprising administering to the patient a corticoidally effective amount of a compound of claim **1**.

4,289,764

STEROID COMPOSITIONS

Hyman Yarrow, Hitchin, and Martin Whitefield, London, both of England, assignors to Drythanol Ltd., London, England

Filed Dec. 4, 1979, Ser. No. 100,038

Int. Cl.[3] **C07J** *7/00;* **A61K** *31/56*

U.S. Cl. 424—243 **4 Claims**

1. In a pharmaceutical composition for topical application comprising an essentially saturated solution of hydrocortisone in an aqueous propylene glycol solution containing at least 15% but less than 50% by weight of propylene glycol, the proportion of hydrocortisone in the total composition being at least 0.08% but not greater than 0.4% by weight of aqueous propylene glycol and from 0.025 to 0.4% based on the total weight of the composition, the improvement which consists in including in the composition sufficient of a pharmacologically acceptable compatible non-toxic acid to bring the pH of the composition to within the range 2.7 to 3.3, and in substantially excluding metallic cations from the composition.

4,289,765

4-AMINOPYRIDINES AND MEDICAMENTS CONTAINING THE SAME

Wilfried Greve; Heinzgeorg von Schuh, both of Wiesbaden, and Hiristo Anagnostopulos, Taunusstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

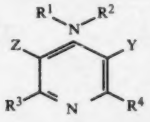
Filed Jan. 7, 1980, Ser. No. 109,913

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2900504

Int. Cl.[3] **A61K** *31/44, 31/535, 31/54;* **C07D** *213/61, 213/85, 413/04, 417/04*

U.S. Cl. 424—246 **8 Claims**

1. 4-Aminopyridines of the formula



(I)

in which

R^1 is hydrogen or alkyl of up to 6 carbon atoms and

R^2 represents (a) alkyl of up to 6 carbon atoms substituted up to three times with at least one radical from the group of halogen and hydroxyl, with formyl acetalized with an alcohol of up to 3 carbon atoms, alkylthio of up to 3 carbon atoms, phenylthio or the corresponding alkyl- and phenylsulfoxy and sulfone groups, the phenyl ring optionally carrying in each case up to three substituents from the group of alkyl, alkyl halide, alkoxy, mono- or dialkylamino having each up to 4 carbon atoms in each alkyl radical, halogen, nitro, amino and hydroxy, or

(b) phenylalkyl or diphenyl-alkyl of up to 6 carbon atoms in the linear or branched alkyl moiety, the phenyl rings optionally being substituted up to three times with at least one radical from the group of alkyl, alkoxy, alkyl halide with up to 4 carbon atoms each, halogen, amino, hydroxy, nitro, the sulfamoyl group and the methylene dioxy radical, or

R^1 and R^2, together with the nitrogen atom present in the 4-position, form a five- to seven-membered heterocyclic ring optionally substituted with alkyl of up to 2 carbon atoms and including up to two hetero-atoms, the second hetero-atom being oxygen, sulfur optionally carrying up to two oxygen atoms, or nitrogen, and

R^3 and R^4 which may be identical or different, each represent alkyl of up to 9 carbon atoms, one of the two radicals optionally also being hydrogen,

Y is a nitro or a cyano group, and

Z stands for hydrogen or halogen, and the physiologically acceptable salts of these compounds.

7. A method of treating a human patient having bronchospasms which comprises oral administration to said patient of an effective dosage of from about 30 to 150 mg/day of a compound as defined in claim **1**.

4,289,766

HETEROCYCLIC CARBOTHIOAMIDES

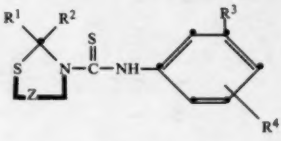
Terry W. Balko, Waldron, and Ronald E. Hackler, Greenfield, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 27, 1977, Ser. No. 865,094

Int. Cl.[3] **C07D** *277/04*

U.S. Cl. 424—246 **87 Claims**

1. A compound of the formula,



wherein

R^1 represents

(A) C_1–C_{18} alkyl;

(B) C_2–C_{18} alkenyl;

(C) C_4–C_{18} alkadienyl;

(D) C_3–C_{12} cycloalkyl, optionally substituted with either one or two C_1–C_3 alkyl groups;

(E) C_5–C_{12} cycloalkenyl, optionally substituted with either one or two C_1–C_3 alkyl groups;

(F) C_6–C_{12} cycloalkadienyl, optionally substituted with either one or two C_1–C_3 alkyl groups;

(G) phenyl, optionally substituted with from one to three groups selected from the group consisting of

(1) C_1–C_6 alkyl,

(2) C_1–C_6 alkoxy,

(3) C_1–C_6 alkylthio,

(4) trifluoromethyl,

(5) halo, and

(6) cyano;

(H) (cycloalkyl)alkyl, containing no more than about 18 carbon atoms, in which the cycloalkyl moiety is as defined hereinabove;

(I) phenylalkyl, containing no more than about 18 carbon atoms, in which the phenyl moiety is as defined hereinabove;

(J) diphenylalkyl, containing no more than about 18 carbon atoms, in which each phenyl moiety is as defined hereinabove;

(K) pyridyl, optionally substituted with either one or two groups selected from the group consisting of

(1) C_1–C_3 alkyl,

(2) C_1–C_3 alkoxy, or

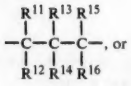
(3) halo;

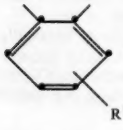
(L) piperidino attached at a position other than the nitrogen atom, optionally substituted with either one or two C_1–C_3 alkyl groups;

(M) morpholino attached at a position other than the nitrogen atom;
(N) pyrazinyl, optionally substituted with either one or two C_1–C_3 alkyl groups;
(O) pyridylalkyl, containing no more than about 17 carbon atoms, in which the pyridyl moiety is as defined hereinabove;
(P) piperidinoalkyl, containing no more than about 17 carbon atoms, in which the piperidino moiety is as defined hereinabove;
(Q) morpholinoalkyl, containing no more than about 16 carbon atoms;
(R) pyrazinylalkyl, containing no more than about 16 carbon atoms, in which the pyrazinyl moiety is as defined hereinabove; or
(S) tetrahydrofurylalkyl, containing no more than about 17 carbon atoms;

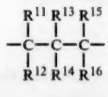
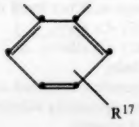
R^2 represents hydrogen or C_1–C_3 alkyl;
R^3 represents
(A) halo,
(B) trifluoromethyl,
(C) cyano, or
(D) 1,1,2,2-tetrafluoroethoxy;
R^4 represents
(A) hydrogen,
(B) halo, or
(C) C_1–C_3 alkyl, with the provisos that when R^4 is halo it can not be in the 2-position and when R^4 is C_1–C_3 alkyl it can not be in the 4-position;
Z represents

(A)


(B)


(C)

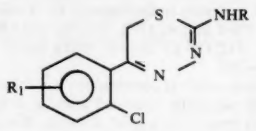
in which each of R^7–R^{16}, inclusive, independently is hydrogen or C_1–C_3 alkyl, with the proviso that the two groups attached to any given carbon atom in (A) or (B) together can not contain more than four carbon atoms; and
R^{17} represents
(1) C_1–C_3 alkyl,
(2) C_1–C_3 alkoxy,
(3) C_1–C_3 alkylthio,
(4) trifluoromethyl,
(5) halo,
(6) cyano, or
(7) hydrogen;
with the proviso that when Z represents


or


R^2 is hydrogen.

4,289,767
5-(CHLOROPHENYL)-6H-1,3,4-THIADIAZINE-2-AMINES
Winton D. Jones, Cincinnati, and Francis P. Miller, Loveland, both of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.
Filed Sep. 4, 1979, Ser. No. 71,952
Int. Cl.[3] **C07D** *285/16;* **A61K** *31/54*
U.S. Cl. 424—246 **9 Claims**

1. A compound of the formula

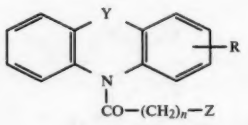


wherein R is H, $C_{1\text{-}5}$ *or* 7-straight or branched chain alkyl or allyl and R_1 is H or Cl, and
the pharmaceutically acceptable acid addition salts thereof.

7. A method of achieving an anxiolytic effect in a patient which comprises administering to a patient in which such effect is desired an amount of a compound of claim **1** to the patient effective to induce such an effect.

4,289,768
PHENOTHIAZINE DERIVATIVES AND A PROCESS FOR THEIR PREPARATION
Joachim Gante; Hans-Eckart Radunz; Dieter Orth; Hans-Jochen Schliep, and Ernst Schorscher, all of Darmstadt, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany
Filed May 2, 1980, Ser. No. 145,652
Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917650
Int. Cl.[3] **A61K** *31/415;* **C07D** *279/30*
U.S. Cl. 424—247 **11 Claims**

1. A phenothiazine derivative of the formula

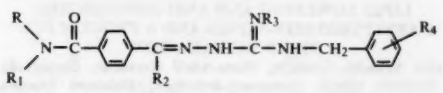


wherein R is H, F, Cl, Br, I, CH_3, CF_3, CN, CH_3O or CH_3CO; Y is S, SO or SO_2; Z is imidazol-1-yl, 2-methylimidazol-1-yl, pyrazol-1-yl or benzimidazol-1-yl; and n is 1, 2 or 3;
or a physiologically acceptable acid addition salt thereof.

8. A pharamaceutical composition comprising an antihypertensively effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier.

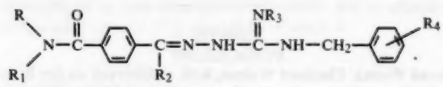
4,289,769
DERIVATIVES OF P-FORMYLBENZAMIDE AMIDINOHYDRAZONE AND USE THEREOF
William B. Wright, Jr., Woodcliff Lake, and Andrew S. Tomcufcik, Old Tappan, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Aug. 8, 1980, Ser. No. 176,233
Int. Cl.[3] **A61K** *31/165, 31/535;* **C07C** *133/12;* **C07D** *295/18*
U.S. Cl. 424—248.56 **16 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein R and R_1 may be the same or different and may be selected from hydrogen and alkyl (C_1–C_6), and where R and R_1 taken together with their associated nitrogen may be morpholine, piperidine and pyrrolidine; R_2 is hydrogen or methyl; R_3 is selected from the group comprising hydrogen, and lower alkyl (C_1–C_3); and R_4 may be hydrogen, lower alkyl (C_1–C_3), fluoro and chloro, the tautomers thereof and the pharmacologically acceptable acid-addition salts thereof.

9. The method of lowering elevated blood pressure in a mammal which comprises administering internally to said mammal an effective amount of a compound selected from the group consisting of those of the formula:



wherein R and R_1 may be the same or different and may be selected from hydrogen and alkyl (C_1–C_6), and where R and R_1 taken together with their associated nitrogen may be morpholine, piperidine and pyrrolidine; R_2 is hydrogen or methyl; R_3 is selected from the group comprising hydrogen, and lower alkyl (C_1–C_3); and R_4 may be hydrogen, lower alkyl (C_1–C_3), fluoro and chloro, the tautomers thereof and the pharmacologically acceptable acid-addition salts thereof.

4,289,770

2-BENZOYL-4-NITROANILIDES AND THEIR USE AS MEDICAMENTS

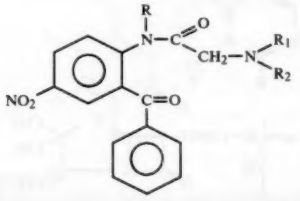
Henri Cousse, and Gilbert Mouzin, both of Castres, France, assignors to Pierre Fabre S.A., Paris, France

Filed Jun. 13, 1980, Ser. No. 159,070

Int. Cl.[3] **A61K** *31/535, 31/16;* **C07D** *295/14;* **C07C** *103/183*

U.S. Cl. 424—248.54 **6 Claims**

1. 2-benzoyl-4-nitro anilides having the formula I:



in which

R represents alkyl, alkenyl, cycloalkyl, or a benzyl;

R_1 represents hydrogen, alkyl or hydroxyalkyl;

R_2 represents hydroxyalkyl, alkenyl or alkynyl, unsubstituted or substituted one or more times by an alkyl radical, or cycloalkyl having three to six carbon atoms, inclusive;

R_1 and R_2 may furthermore form, with the nitrogen atom to which they are attached, a nitrogen heterocycle which may also contain a second heteroatom selected from oxygen and nitrogen;

provided, however that, when R_2 represents hydroxyalkyl R_1 may not be hydrogen as well as their salts obtained with therapeutically acceptable inorganic or organic acids.

5. A pharmaceutical composition suitable for use as a hypnotic comprising an effective hypnotic amount of a compound of claim **1** or claim **2** in combination with a pharmaceutically acceptable carrier or adjuvant.

4,289,771

3-SULPHONYL-BENZO-1,2,4-TRIAZINE AND 3-SULPHONYL-BENZO-1,2,4-TRIAZINE 1-OXIDE COMPOUNDS, THEIR PRODUCTION AND THEIR MEDICINAL USE

Klaus Sasse, Berg.-Gladbach; Ingo Haller; Manfred Plempel, both of Wuppertal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

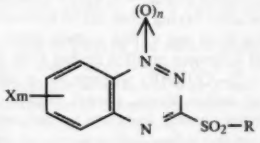
Filed Feb. 29, 1980, Ser. No. 126,054

Claims priority, application Fed. Rep. of German 21, 1979, 2910974

Int. Cl.[3] **C07D** *253/08;* **A61K** *31/53*

U.S. Cl. 424—249 **18 Claims**

1. A compound which is a 3-sulphonyl-benzo-1,2,4-triazine or 3-sulphonyl-benzo-1,2,4-triazine 1-oxide of the formula



(I)

in which

X is a hydrogen or halogen atom or an alkyl, trifluoromethyl, alkoxy or nitro group,

R is an alkyl group which is optionally substituted by phenyl optionally substituted by halogen, nitro or methyl, halogen, or alkoxy, an alkenyl or cycloalkyl group or a phenyl radical which is optionally substituted by alkyl, halogenoalkyl, halogen, alkoxy or nitro,

m is 1, 2, 3, or 4, and

n is 0 or 1.

16. A method of combating microbial illnesses in warmblooded animals which comprises administering to the animals an antimicrobially effective amount of a compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,289,772

1-PIPERIDINOPHTHALAZINES AS CARDIAC STIMULANTS

Simon F. Campbell, Deal; John C. Danilewicz; Anthony G. Evans, both of Ash, Nr. Canterbury, and Allan L. Ham, Broadstairs, all of England, assignors to Pfizer Inc., New York, N.Y.

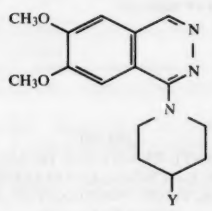
Division of Ser. No. 908,664, May 23, 1978. This application Dec. 13, 1979, Ser. No. 103,342

Claims priority, application United Kingdom, Jun. 3, 1977, 23582/77

Int. Cl.[3] **A61K** *31/495*

U.S. Cl. 424—250 **20 Claims**

1. A method of treating congestive heart failure in a human subject having such condition which comprises parenterally administering to said human subject a congestive heart failure treating amount of a compound selected from the group consisting of:



and a pharmaceutically acceptable acid addition salt thereof, wherein Y is selected from the group consisting of $—CH_2COR_1$ wherein R_1 is alkyl having from one to four carbon atoms or alkoxy having from one to four carbon atoms; $—N(R_2)COR_3$ wherein R_2 is hydrogen or alkyl having from one to four carbon atoms, and R_3 is alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, phenyl or benzyloxy; $—N(R_2)SO_2R_4$ wherein R_2 is hydrogen or alkyl having from one to four carbon atoms and R_4 is alkyl having from one to four carbon atoms, phenyl, pyridyl, benzyl or dialkoxyphenyl wherein said alkoxy has from one to four carbon atoms; $—N(R_2)—CONR_5R_6$ wherein R_2 is hydrogen or alkyl having from one to four carbon atoms, R_5 is alkyl having from one to four carbon atoms, benzyl or pyridyl and R_6 is hydrogen or alkyl having from one to four carbon atoms; —O—$CONHR_7$ wherein R_7 is alkyl having from one to four carbon atoms, phenyl, benzyl or pyridyl; hydroxy; alkanoyloxy having from one to four carbon atoms; alkoxy having from one to four carbon atoms; substituted alkyl wherein said alkyl has from one to five carbon atoms and said substituent is hydroxy, alkoxy having from one to four carbon atoms or $—CONR_2R_6$ wherein R_2 and R_6 are each hydrogen or alkyl having from one to four carbon atoms; and substituted alkoxy wherein said alkoxy has from two to four carbon atoms and said substituent is hydroxy or alkoxy having from one to four carbon atoms, with the proviso that other than the alpha-carbon atoms is substituted.

4,289,773

ANTIVIRAL COMBINATIONS

Donald C. DeLong, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 95,804, Nov. 19, 1979, which is a division of Ser. No. 49,671, Jun. 18, 1979, Pat. No. 4,210,647. This application Nov. 14, 1980, Ser. No. 206,748

Int. Cl.[3] **A61K** *31/495, 31/13*

U.S. Cl. 424—250 **1 Claim**

1. A method of suppressing influenza virus infections in mammals which comprises orally administering to a mammal exposed to influenza virus a virus-suppressing amount of a combination containing from 0.5–5 mg./kg. of ethyl 6,7-bromo-4-dihydro-3-oxoquinoxaline carboxylate and from 0.3–3 mg./kg. of 1-(1-adamantyl)-1-aminoethane.

4,289,774

LIPID LOWERING AND ANTI-THROMBOTIC 6-ARYLPYRIDAZIN-3-ONES AND A PROCESS FOR THEIR PREPARATION

Erich Schacht, Seeheim; Hans-Adolf Kurmeier, Darmstadt; Joachim Gante, Darmstadt-Arheilgen; Reinhard Lissner, Fischbachtal- Lichtenberg; Guido Melzer, Hofheim, and Dieter Orth, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 19, 1979, Ser. No. 86,604

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845456

Int. Cl.[3] **C07D** *237/04;* **A61K** *31/50;* **C07D** *237/26, 401/04*

U.S. Cl. 424—250 **4 Claims**

1. 5-Methyl-6-p-biphenylyl-2,3,4,5-tetrahydropyridazin-3-one.

2. A pharmaceutical composition comprising an amount of a compound of claim 1 effective to lower the lipid level in a patient and a pharmaceutically acceptable adjuvant.

4,289,775

PENICILLINS

Bernd Wetzel; Eberhard Woitun, both of Biberach an der Riss; Wolfgang Reuter, Laupertshausen; Roland Maier, Biberach an der Riss; Uwe Lechner, Ummendorf, and Hanns Goeth, Biberach an der Riss, all of Fed. Rep. of Germany, assignors to Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

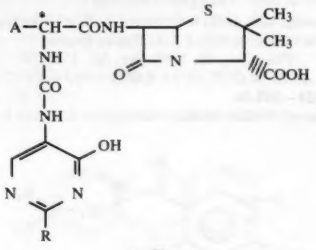
Continuation of Ser. No. 117,103, Jan. 31, 1980, abandoned. This application May 14, 1980, Ser. No. 149,839

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1979, 2910190

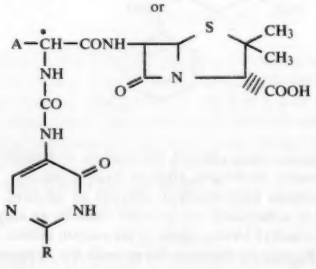
Int. Cl.[3] **A61R** *31/505;* **C07D** *499/68;* **C07D** *499/70*

U.S. Cl. 424—251 **6 Claims**

1. A compound of the formula



or



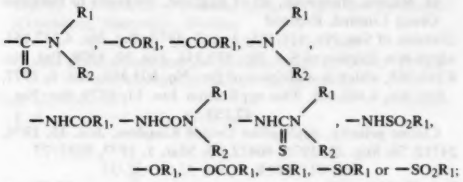
wherein

A is phenyl, p-hydroxy-phenyl, 2-thienyl, 3-thienyl or 3,4-disubstituted phenyl, where the substituents, which may be identical to or different from each other, are each chlorine, hydroxyl or methoxy;

R is —NH—Z—X;

Z is straight or branched alkylene of 1 to 6 carbon atoms or cycloalkylene of 3 to 6 carbon atoms;

X is cyano, hydroxyl, mercapto, aminocarbonyl, aminosulfonyl,



R_1 is straight or branched alkyl of 1 to 4 carbon atoms or phenyl; and

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms;

or a non-toxic, pharmacologically acceptable salt thereof formed with an onorganic or organic base.

5. An antibacterial pharmaceutical composition consisting essentially of an inert pharmaceutical carrier and an effective antibacterial amount of a compound of claim **1**.

4,289,776

XANTHINE DERIVATIVES

Werner Mohler, Hofheim; Manfred Jayme, Rüsselsheim, and Jaromir Komarek, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

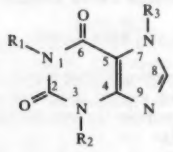
Continuation of Ser. No. 775,551, Mar. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 531,048, Dec. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 479,434, Jun. 14, 1974, abandoned. This application Apr. 23, 1979, Ser. No. 32,536

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1973, 2330742

Int. Cl.[3] **A61K** *31/52;* **C07D** *473/06*

U.S. Cl. 424—253 **19 Claims**

1. A compound of the formula



(I)

wherein one of

R_1 and R_2 is a straight-chain or branched oxoalkyl having from 5 to 8 carbon atoms; the oxygen atom of the oxoalkyl is attached to a non-terminal carbon atom, is separated from the nearest ring nitrogen atom by at least three carbon atoms when it is in the (ω-1)-position of the oxoalkyl and is separated from the nearest ring nitrogen atom by at least four carbon atoms when it is in a position other than the (ω-1)-position of the oxoalkyl;

R_2 is alkyl having up to 12 carbon atoms and the other of R_1 and R_3 is straight-chain or branched alkyl having from 1 to 12 carbon atoms; at least one of R_1, R_2 and R_3 being alkyl having more than one carbon atom.

11. A pharmaceutical composition comprising a pharmaceutical carrier or excipient and a member according to claim **1** in an amount and concentration which are effective to improve blood circulation of an arterial-blood-flow-deficient host to which the composition is administered.

4,289,777

QUINOLONECARBOXYLIC ACID DERIVATIVES AND PHARMACEUTICAL PREPARATIONS THEREOF FOR TREATMENT OF AN ALLERGIC DISEASE OF THE RESPIRATORY TRACT

Rudolf Albrecht; Eberhard Schröder, and Irmgard Böttcher, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

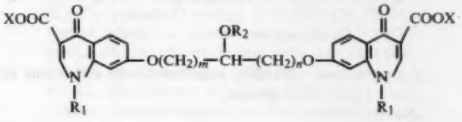
Filed Dec. 27, 1979, Ser. No. 107,676

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1978, 2856908

Int. Cl.[3] **A61K** *31/47;* **C07D** *401/12*

U.S. Cl. 424—258 **15 Claims**

1. A quinolone compound of the formula



wherein

m and n independently are each 1–4;

R_1 is hydrogen or alkyl of 1–6 carbon atoms;

R_2 is hydrogen, alkanoyl of 1–8 carbon atoms or benzoyl; and

X is hydrogen or alkyl of 1–6 carbon atoms

or, for those compounds wherein X is H, the pharmaceutically acceptable salts thereof with a base.

11. A pharmaceutical composition comprising an amount of a compound of claim **1** effective to treat an allergic disease of the respiratory tract and a pharmaceutically acceptable carrier.

15. A method of treating an allergic disease of the respiratory tract in a mammal which comprises administering an amount of a compound of claim **1** effective for such treatment.

4,289,778

2-(SUBSTITUTED IMINO)-N-(3-SUBSTITUTED PHENYL)-3-THIAZOLIDINECARBOTHIOAMIDES

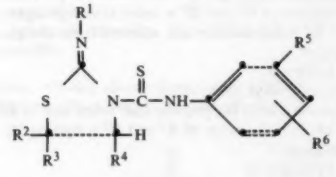
Terry W. Balko, Waldron, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 27, 1977, Ser. No. 864,998

Int. Cl.[3] **C07D** *277/04*

U.S. Cl. 424—263 **97 Claims**

1. A compound of the formula,



wherein

R^1 represents

(A) C_1–C_{18} alkyl;

(B) C_2–C_{18} alkenyl;

(C) C_4–C_{18} alkadienyl;

(D) C_3–C_{12} cycloalkyl, optionally substituted with either one or two C_1–C_4 alkyl groups;

(E) C_5–C_{12} cycloalkenyl, optionally substituted with either one or two C_1–C_3 alkyl groups;

(F) C_6–C_{12} cycloalkadienyl, optionally substituted with either one or two C_1–C_3 alkyl groups;

(G) phenyl, optionally substituted with from one to three groups selected from the group consisting of

(1) C_1–C_6 alkyl,

(2) C_1–C_6 alkoxy,

(3) C_1–C_6 alkylthio,
(4) trifluoromethyl,
(5) halo, and
(6) cyano;

(H) (cycloalkyl)alkyl, containing no more than about 18 carbon atoms, in which the cycloalkyl moiety is as defined herein above;

(I) phenylalkyl, containing no more than about 18 carbon atoms, in which the phenyl moiety is as defined hereinabove;

(J) diphenylalkyl, containing no more than about 18 carbon atoms, in which each phenyl moiety is as defined hereinabove;

(K) pyridyl, optionally substituted with either one or two groups selected from the group consisting of
(1) C_1–C_3 alkyl,
(2) C_1–C_3 alkoxy, or
(3) halo;

(L) piperidino, optionally substituted with either one or two C_1–C_3 alkyl groups;

(M) morpholino;

(N) pyrazinyl, optionally substituted with either one or two C_1–C_3 alkyl groups;

(O) pyridylalkyl, containing no more than about 17 carbon atoms, in which the pyridyl moiety is as defined hereinabove;

(P) piperidinoalkyl, containing no more than about 17 carbon atoms, in which the piperidino moiety is as defined hereinabove;

(Q) morpholinoalkyl, containing no more than about 16 carbon atoms;

(R) pyrazinylalkyl, containing no more than about 16 carbon atoms, in which the pyrazinyl moiety is as defined hereinabove;

(S) tetrahydrofurylalkyl, containing no more than about 17 carbon atoms; and

(T) substituted amino, having the formula

in which R^8 and R^9 independently are selected from the group consisting of hydrogen, C_1–C_{18} alkyl, phenyl, and phenylalkyl, wherein the phenyl and phenylalkyl moieties are as defined hereinabove, provided that at least one of R^8 and R^9 is other than hydrogen;

R^2 and R^3 independently are selected from the group consisting of
(A) hydrogen,
(B) C_1–C_3 alkyl, and
(C) phenyl, with the proviso that when one of R^2 and R^3 is phenyl, the other of R^2 and R^3 is hydrogen;

R^4 represents
(A) hydrogen or
(B) C_1–C_3 alkyl;

R^5 represents
(A) halo,
(B) trifluoromethyl,
(C) cyano, or
(D) 1,1,2,2-tetrafluoroethoxy; and

R^6 represents
(A) hydrogen,
(B) halo, or
(C) C_1–C_3 alkyl;

with the provisos that when R^5 is bromo, R^1 can not be 3-bromophenyl; when R^5 is cyano, R^1 can not be 3-cyanophenyl; when R^5 is halo and R^6 is halo, R^6 can not be in the 2-position; and when R^5 is halo and R^6 is C_1–C_3 alkyl, R^6 can not be in the 4-position.

4,289,779

ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John P. Clayton, Horsham, and Norman H. Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

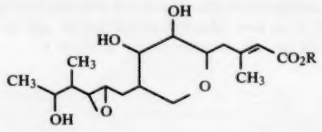
Division of Ser. No. 931,385, Aug. 7, 1978, Pat. No. 4,237,161, which is a division of Ser. No. 873,394, Jan. 30, 1978, Pat. No. 4,166,863, which is a division of Ser. No. 803,466, Jun. 6, 1977, Pat. No. 4,102,901. This application Jun. 11, 1979, Ser. No. 47,159

Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77

Int. Cl.³ A61K *31/44, 31/47, 31/35*

U.S. Cl. 424—263 **12 Claims**

7. The method of treating bacterial infections in humans and other animals which comprises administering to a human or other animal in need thereof an antibacterially effective amount of a compound of the formula:



wherein R is a heterocyclic ring system comprising oxygen, nitrogen or sulfur as the hetero atom and containing six ring members in the hetero ring, said system being a monocyclic or a fused benzo bicyclic system and being unsubstituted or substituted with a member selected from the group consisting of alkyl of 1 to 6 carbon atoms, carbalkoxy of 1 to 6 carbon atoms in the alkoxy group, phenyl and oxo.

4,289,780

METHODS OF TREATING SLEEP DISTURBANCE

Rene Spiegel, Binningen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

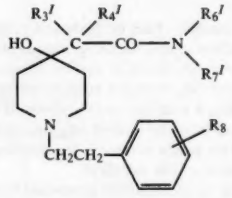
Filed Apr. 7, 1980, Ser. No. 138,090

Claims priority, application United Kingdom, Apr. 12, 1979, 12923/79

Int. Cl.³ A61K *31/447*

U.S. Cl. 424—267 **7 Claims**

1. A method of treating sleep disturbance in a subject in need of such treatment, which method comprises administering to said subject an amount sufficient to treat sleep disturbance of a compound of formula Ia



Ia

wherein

R_3^I is C_{1-4}-alkyl,

R_4^I and R_6^I are independently hydrogen or C_{1-4}-alkyl,

R_7^I is C_{1-4}-alkyl, C_{4-6}-cycloalkyl or C_{4-6}-cycloalkyl-C_{1-4}-alkyl, and

R_8 is hydrogen, bromine, chlorine, fluorine or C_{1-4}-alkyl, or a pharmaceutically acceptable acid addition salt thereof.

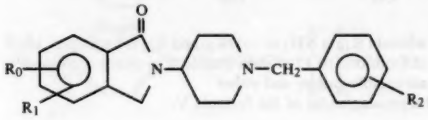
4,289,781

ANTI-PSYCHOTIC PHTHALIMIDINE DERIVATIVES

Karl S. Bengtsson; Seth O. Thorberg, both of Järna, and Sven O. Ogren, Nykvarn, all of Sweden, assignors to Astra Läkemedel Aktiebolag, Södertälje, Sweden

Filed Aug. 14, 1980, Ser. No. 177,888
Claims priority, application Sweden, Aug. 27, 1979, 7907121
Int. Cl.³ C07D *401/04;* A61K *31/40*
U.S. Cl. 424—267 **13 Claims**

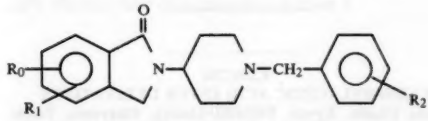
1. A compound of the formula



I

and pharmaceutically acceptable acid-addition salts thereof, in which formula R_0 and R_1 are the same or different and are each selected from hydrogen, halogen, alkyl having 1, 2 or 3 carbon atoms, alkoxy having 1, 2 or 3 carbon atoms, and trifluoromethyl, and R_2 is selected from hydrogen, halogen, alkyl having 1, 2 or 3 carbon atoms, alkoxy having 1, 2 or 3 carbon atoms, and trifluoromethyl.

10. A method for the treatment of psychoses in man, characterized by the administration to a host in need of such treatment of a therapeutically effect amount of a compound of the formula



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or a pharmaceutically acceptable acid-addition salt thereof, in which formula R_0 and R_1 are the same or different and are each selected from hydrogen, halogen, alkyl having 1, 2 or 3 carbon atoms, alkoxy having 1, 2 or 3 carbon atoms, and tridluoromethyl, and R_2 is selected from hydrogen, halogen, alkyl having 1, 2 or 3 carbon atoms, alkoxy having 1, 2 or 3 carbon atoms, and trifluoromethyl.

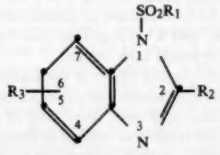
4,289,782

ANTIVIRAL 1-SULFONYLBENZIMIDAZOLES

Charles J. Paget; James W. Chamberlin, both of Indianapolis, and James H. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 30,782, Apr. 17, 1979, which is a division of Ser. No. 883,113, Mar. 3, 1978, Pat. No. 4,174,454, which is a division of Ser. No. 750,991, Dec. 15, 1977, Pat. No. 4,118,742, which is a continuation-in-part of Ser. No. 608,415, Aug. 28, 1975, abandoned. This application Nov. 14, 1979, Ser. No. 94,149
Int. Cl.³ A61K *31/415;* A01N *43/52*
U.S. Cl. 424—273 B **27 Claims**

1. A method of suppressing the growth of a virus which comprises adding to a medium in which the virus is growing an antivirally effective amount of a compound of the formula



wherein

R_1 is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, thienyl, or R_4R_5N—, wherein R_4 and R_5 are independently C_1–C_3 alkyl or R_4 and R_5, when taken together with the nitrogen atom to which they are attached, are pyrrolidino, piperidino or morpholino;

R_2 is amino, formamido, acetamido, propionamido or butyramido;

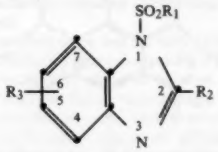
R_3 is

hydroxy, C_2–C_8 alkanoyloxy, phenylacetoxy, α-C_1–C_7 alkyl-α-hydroxybenzyl or benzoyloxy; or

wherein R_6 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl) methyl, 1-(C_3–C_7 cycloalkyl) ethyl, benzyl, phenyl or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl; or Z=C(R_6)—, wherein Z is hydroxyimino, C_1–C_4 alkoxyimino, C_1–C_4 acyloxyimino, benzyloxyimino, benzoyloxyimino, hydrazono, thiocarbamylhydrazono, carboxymethoxyimino, methoxycarbonylhydrazono, ethoxycarbonylhydrazono, carbamylhydrazono, C_1–C_4 alkoxycarbonylethylcarbonyloxyimino, benzyloxycarbonylaminomethylcarbonyloxyimino, p-nitrobenzyloxycarbonylethylcarbonyloxyimino, phthalimidomethylcarbonyloxyimino, or C_1–C_7 alkylidene; and

R_3 is at the 5 or 6 position.

11. A method of suppressing the growth of a virus which comprises administering intranasally to a warm-blooded animal infected with the virus an antivirally effective amount of a compound of the formula:



wherein

R_1 is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, thienyl, or R_4R_5N—, wherein R_4 and R_5 are independently C_1–C_3 alkyl or R_4 and R_5, when taken together with the nitrogen atom to which they are attached, are pyrrolidino, piperidino or morpholino;

R_2 is amino, formamido, acetamido, propionamido or butyramido;

R_3 is

hydroxy, C_2–C_8 alkanoyloxy, phenylacetoxy, α-C_1–C_7 alkyl-α-hydroxybenzyl or benzoyloxy; or

wherein R_6 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, benzyl, phenyl or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl; or Z=C(R_6)—, wherein Z is hydroxyimino, C_1–C_4 alkoxyimino, C_1–C_4 acyloxyimino, benzyloxyimino, benzoyloxyimino, hydrazono, thiocarbamylhydrazono, carboxymethoxyimino, methoxycarbonylhydrazono, ethoxycarbonylhydrazono, carbamylhydrazono, C_1–C_4 alkoxycarbonylethylcarbonyloxyimino, benzyloxycarbonylaminomethylcarbonyloxyimino, p-nitrobenzyloxycarbonylethylcarbonyloxyimino, phthalimidomethylcarbonyloxyimino, or C_1–C_7 alkylidene; and

R_3 is at the 5 or 6 position.

4,289,783

ETOMIDATE-CONTAINING COMPOSITIONS

Jean Mesens, Geel, Belgium, assignor to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation of Ser. No. 942,236, Sep. 14, 1978, abandoned. This application Jan. 16, 1980, Ser. No. 112,671

Int. Cl.³ A61K *31/415*

U.S. Cl. 424—273 R **12 Claims**

1. An etomidate-containing infusion liquid for intravenous administration to provide an anesthetic effect which comprises a physiologically acceptable infusion liquid to which has been added a solution of etomidate hydrochloride or hydrobromide in a medium which contains from 80% to about 99.8% by weight of ethanol to provide an anesthetically effective concentration of at least 0.05 mg/ml of atomidate in the infusion liquid.

4,289,784

PYROMELLITIC DIIMIDES AND METHOD OF INCREASING FEED EFFICIENCY IN RUMINANT ANIMALS

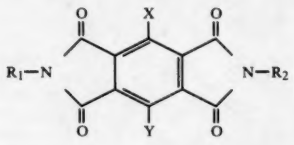
Richard J. Bochis, East Brunswick; Michael H. Fisher, and Bruce O. Linn, both of Bridgewater, all of N.J., assignors to Merck & Co., Inc., N.J.

Division of Ser. No. 954,040, Oct. 23, 1978, abandoned. This application Apr. 22, 1980, Ser. No. 142,795

Int. Cl.³ A61K *31/40;* **C07D** *209/56*

U.S. Cl. 424—274 **13 Claims**

1. A compound having the formula:



wherein R_1 is hydrogen and R_2 is loweralkyl, loweralkenyl, loweralkynyl, cycloalkyl, loweralkanoyl, benzoyl, substituted phenyl wherein the substituent is sulfonamido, hydroxy, carboxy, nitro, methylthio, or hydroxy loweralkyl; substituted loweralkyl wherein the substituents are one or two of hydroxy, halogen nitro, loweralkoxy, carboxy, phenyl, hydroxyloweralkoxy, loweralkanoyloxy, phenoxy, amino, mono- or di-loweralkylamino, mercapto, loweralkylthio, loweralkylsulfinyl, loweralkylsulfonyl, loweralkoxycarbonyl, carbamyl, hydroxyloweralkylthio, hydroxyloweralkylsulfinyl, hydroxyloweralkylsulfonyl, hydroxyloweralkylamino, di-(hydroxyloweralkyl)amino, loweralkanoylamino or hydroxyphenyl; diloweralkylamino, or mono-substituted amino wherein the substituent is loweralkanoyl, benzoyl or loweralkoxycarbonyl; and

X and Y are independently hydrogen, loweralkyl or halogen.

12. A method for increasing the feed efficiency of a ruminant animal which comprises orally administering to said ruminant animal an effective amount of a compound of claim **1**.

4,289,785

METHOD AND COMPOSITIONS INVOLVING PROSTAGLANDINS

John W. Wilks, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

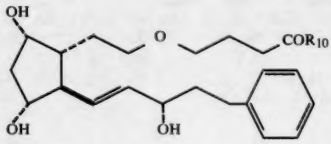
Filed Aug. 6, 1980, Ser. No. 175,467

Int. Cl.³ A61K *31/335, 31/215, 31/19, 31/165*

U.S. Cl. 424—279 **14 Claims**

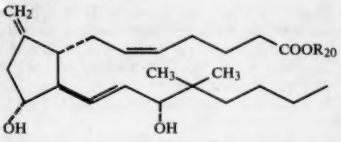
1. A method for inducing menses in a female primate which comprises concomitantly administering to said primate an amount effective to induce menses of

(1) a prostaglandin of the formula IV,



wherein R_{10} is NH_2 or $—OR_{20}$ and R_{20} is hydrogen, alkyl of from one to 12 carbon atoms, or a pharmacologically acceptable cation; and either

(2) a prostaglandin of the formula V,



wherein R_{20} is defined as above, R_{20} in formulas IV and V being the same or different, or $PGF_{2\alpha}$ 1,15-lactone.

4,289,786

FARNESYLACETIC ACID ESTER DERIVATIVES

Susumu Okabe, Kyoto; Yoshiaki Omura, Okayama; Yoichi Ninagawa, and Yoshiji Fujita, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

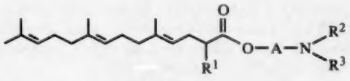
Filed Nov. 21, 1979, Ser. No. 96,570

Claims priority, application Japan, Nov. 28, 1978, 53-147622

Int. Cl.³ A61K *31/23;* **C09F** *5/08*

U.S. Cl. 424—312 **20 Claims**

1. A farnesylacetic acid ester derivative selected from the group consisting of compounds represented by the general formula (I)



wherein

A is a straight or branched alkylene group having 2 to 10 carbon atoms in its principal chain,

R′ is a hydrogen atom, an alkyl group having 1 to 8 carbon atoms, a cycloalkyl group having 5 or 6 carbon atoms, an aryl group having 6 to 10 carbon atoms, an aralkyl group having 7 to 9 carbon atoms, or an alkenyl group having 2 to 15 carbon atoms, and

R^2 and R^3 are the same or different and each is a hydrogen atom or an alkyl group having 1 to 8 carbon atoms,

provided that the total number of carbon atoms contained in said A, R^1, R^2 and R^3 groups is at least five; and pharmaceutically acceptable salts thereof.

18. A method of treating ulcers of the mammalian digestive tract in an afflicted host which comprises administering to said host a farnesylacetic acid ester derivative or a pharmaceutically acceptable salt thereof as defined in claim **1** in a pharmaceutically acceptable carrier in dosage unit form in a daily dose ranging from about 100 mg to about 2500 mg of said derivative or pharmaceutically acceptable salt thereof.

4,289,787

QUATERNARY AMMONIUM ANTIARRHYTHMIC DRUGS

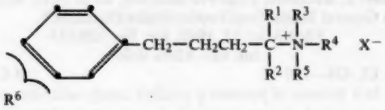
Bryan B. Molloy, North Salem, and Mitchell I. Steinberg, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 861,789, Dec. 19, 1977, abandoned. This application Dec. 10, 1979, Ser. No. 102,043

Int. Cl.[3] A61K *31/14;* C07C *85/00, 87/00, 93/00*

U.S. Cl. 424—329 28 Claims

1. A compound having the general formula



wherein:

R^1 is hydrogen or C_1–C_2 alkyl;

R^2 is hydrogen or C_1–C_3 alkyl;

R^3 is C_1–C_4 alkyl or phenyl C_1–C_4 alkyl;

R^4 is C_1–C_8 alkyl;

R^5 is C_6–C_{10} alkyl;

R^6 is hydrogen, hydroxy, halogen, nitro, C_1–C_3 alkoxy, or C_1–C_3 alkyl; and

X is a therapeutically acceptable anion.

19. A method of treating re-entrant arrhythmias comprising administering to a subject in need thereof an antiarrhythmically effective dose of a compound of claim 1.

4,289,788

INSTANT YOGURT COMPOSITION

Stanley D. Cajigas, Point Pleasant, N.J., assignor to M P Food Technology, Inc., Fairfield, N.J.

Filed Jun. 25, 1979, Ser. No. 51,819

Int. Cl.[3] A23C *9/12, 23/00*

U.S. Cl. 426—61 2 Claims

1. An instant powdered composition comprising a mixture of (a) from about 0.01 to 5 percent by weight Lactobacillus culture, (b) from about 1 to about 35 percent by weight deactivated yogurt powder, (c) from about 2 to about 25 percent by weight gelatin, (d) from about 0.1 to about 20 percent by weight locust bean gum, and (e) from about 10 to about 50 percent by weight of a mixture of acid whey and citric acid based upon the weight of the total composition.

4,289,789

INSTANT YOGURT DRINK COMPOSITION

Stanley D. Cajigas, Point Pleasant, N.J., assignor to M P Food Technology, Inc., Fairfield, N.J.

Filed Jun. 25, 1979, Ser. No. 51,820

Int. Cl.[3] A23C *9/12, 23/00*

U.S. Cl. 426—61 2 Claims

1. An instant powdered composition which may be reconstituted to form a yogurt drink, said composition comprising a mixture of (a) from about 0.01 to about 5 percent by weight Lactobacillus culture, (b) from about 1 to about 35 percent by weight deactivated yogurt powder, (c) from about 0.1 to about 10 percent by weight of carboxy methyl cellulose, (d) from about 0.1 to about 20 percent by weight locust bean gum, and (e) from about 10 to about 50 percent by weight of a mixture of acid whey and citric acid based upon the weight of the total composition.

4,289,790

SIZZLING AND CRUNCHY CHOCOLATE CANDY

Georges Bruelle, Paris, France, assignor to General Foods France S.A., Rueil Malmaison, France

Filed Feb. 25, 1980, Ser. No. 124,029

Int. Cl.[3] A23G *3/00*

U.S. Cl. 426—93 14 Claims

1. A confection which comprises:

(a) a crunchy core selected from the group consisting of cereal, dried fruit, nuts and mixtures thereof, and

(b) a protective matrix coating formed on said core, said matrix coating comprising alternate layers of chocolate and particles of gasified candy, the innermost and outermost layers of said coating being chocolate, said particles of gasified candy being from −4 to +40 U.S. Standard Sieve.

4,289,791

ICE CREAM CONE WITH JACKET ATTACHED AND METHOD FOR PRODUCING SAME

David Weinstein, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Continuation-in-part of Ser. No. 885,278, Mar. 10, 1978, and Ser. No. 910,886, May 30, 1978. This application May 4, 1979, Ser. No. 36,227

Int. Cl.[3] B65G *59/00;* A21D *13/00*

U.S. Cl. 426—139 15 Claims

1. A method of adhering a sanitary jacket to a conformally shaped ice cream cone comprising the steps of:

interposing a mixture of water and an adhesion-reducing agent between said sanitary jacket and said ice cream cone;

causing said sanitary jacket and said ice cream cone to be brought together in juxtaposition with said mixture of water and adhesion-reducing agent being dispersed therebetween; and

drying the combined cone and sanitary jacket;

said adhesion-reducing agent comprising a food grade, nontoxic and hydrophilic material selected from the group consisting of an alcohol, a natural sugar syrup, a surfactant, and mixtures thereof, which is mixed with water in an amount sufficient to cause said adhesion while at the same time permitting separation of the jacket from the cone with substantially no jacket or cone tear.

4,289,792

MICROWAVE TREATMENT OF FOOD PRODUCTS

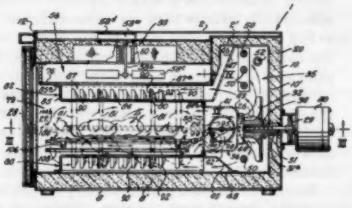
Donald P. Smith, 4530 Woodfin Dr., Dallas, Tex. 75220

Division of Ser. No. 687,982, May 19, 1976, Pat. No. 4,154,861. This application Mar. 16, 1979, Ser. No. 21,261

The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.

Int. Cl.[3] A21D *6/00*

U.S. Cl. 426—241 6 Claims



1. A method of controlling heat transferred to a food product comprising the steps of: delivering microwave energy to heat the food product; forming a plurality of streams of high velocity heated gas; directing each of the streams of high

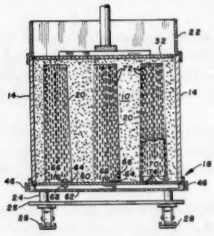
velocity heated gas perpendicular to the surface of the food product such that the streams of high velocity gas impinge against discrete areas on the surface of the food product, before gas in the streams is diffused, to wipe away the boundary layer of air and moisture from the discrete areas against which the streams impinge; and moving the food product relative to the streams of high velocity gas such that heat is transferred to the surface of the food product at areas upon which the streams of high velocity gas impinge to increase the temperature of the surface of the food product at the areas of impingement before the areas of impingement move out of impinging relation with the streams of high velocity gas.

4,289,793

METHOD OF MAKING CHEESE

Leon D. Gustafson, and Wayne C. Mielke, both of Marshfield, Wis., assignors to Land O'Lakes, Inc., Arden Hills, Minn.

Division of Ser. No. 1,598, Jan. 8, 1979. This application May 12, 1980, Ser. No. 148,990
Int. Cl.[3] A23C *19/05*
U.S. Cl. 426—491 3 Claims



1. A method of manufacturing cheese from curd, the method comprising:

filling the curd into a container having a removable bottom, side walls, and an essentially open top, and having a plurality of upstanding perforated tapered posts secured to and extending and tapering from the bottom to substantially a desired height of the curd after compacting, the upstanding perforated tapered posts being essentially uniformly distributed within the container and being spaced longitudinally and laterally from one another and from the sidewalls of the container along their entire height such that the curd completely surrounds the upstanding perforated tapered posts as the container is filled, each of said tapered posts having an essentially diamond-shaped cross-section in which the cross-sectional length is substantially greater than the cross-sectional width;

inserting a pressure plate into the top of the container over the curd, applying pressure downwardly to the pressure plate and hence to the curd in the container substantially parallel to the longitudinal axes of the posts to compact the curd and to cause draining through the upstanding perforated tapered posts through openings in the bottom to whey collecting means beneath said posts;

continuing such downward pressure until the under surface of the pressure plate is slightly spaced from the tops of the tapered posts so that draining of the whey is accomplished without the need of inserting probes from above;

inverting the container with the compacted curd therein;

withdrawing the bottom and the inverted upstanding perforated posts secured thereto from the curd, and

applying pressure downwardly to the curd to cause substantial closing of the downwardly extending essentially diamond shaped openings produced as a result of withdrawing the inverted upstanding perforated posts to permit knitting together of the curd to provide a cheese block of uniform texture.

4,289,794

PROCESS OF PREPARING GASIFIED CANDY

Fredric Kleiner, New City; Pradip K. Roy, Yorktown, and Michael J. Kuchman, Hopewell Junction, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 12, 1980, Ser. No. 129,513
Int. Cl.[3] A23G *9/00*
U.S. Cl. 426—660 8 Claims

1. In a process of preparing gasified candy whereby a sugar melt is gasified at superatmospheric pressure and the gasified sugar melt is cooled below its fusion temperature under superatmospheric pressure to form a gasified candy, the improvement which comprises:

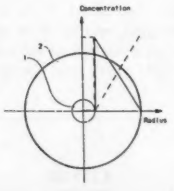
maintaining the sugar melt during the gasification at a temperature below about 280° F. effective to produce in the gasified candy product observable gas bubbles wherein the majority of the observable gas bubbles have a diameter of above about 225μ, and wherein the gasifying gas is carbon dioxide, nitrogen or air.

4,289,795

METHOD FOR PREPARING PREPARATIONS HAVING CONTROLLED RELEASE OF AN ACTIVE COMPONENT

Conny B. Bogentoft, Mölndal, and Curt H. Appelgren, Frölunda, both of Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

Continuation of Ser. No. 742,283, Nov. 16, 1976, abandoned. This application Feb. 21, 1979, Ser. No. 13,124
Claims priority, application Sweden, Nov. 17, 1975, 7512883
Int. Cl.[3] A61K *27/12*
U.S. Cl. 427—3 12 Claims



1. A process for producing a preparation comprising a plurality of granules each having a core and a unitary layer thereon containing at least one pharmaceutically active material which, on disintegration, release said pharmaceutically active material at a controlled rate, comprising applying to said cores in a continuous coating operation a solution or suspension containing at least one active compound and at least one pharmaceutically inactive release controlling substance over a period of time sufficient to cause said unitary layer of said active ingredient and inactive release controlling substance to form on each core to give granules of size 0.3–2 mm, during said time period the concentration of active ingredient being decreased in the solution or suspension from which the layer is formed by adding additional release controlling substance to

the solution or suspension, whereby there results granules each having a layer containing an active ingredient in which layer the concentration of active ingredient decreased radially outwardly from the core to the outer surface of said layer.

4,289,796

Patent Not Issued For This Number

4,289,797

METHOD OF DEPOSITING UNIFORM FILMS OF SI_xN_y OR SI_xO_y IN A PLASMA REACTOR

Aline Akselrad, Princeton, N.J., assignor to Western Electric Co., Incorporated, New York, N.Y.

Filed Oct. 11, 1979, Ser. No. 83,902
Int. Cl.³ C23C *11/00*
U.S. Cl. 427—39 **6 Claims**

1. A method of depositing a uniform dielectric film on a silicon substrate, comprising the steps of:

flowing a first plasma comprising an excited mixture of inert gas and a volatile Si compound over said substrate thereby to form a film having porous a-Si_xH_y over the surface of said substrate;

discontinuing the flow of said first plasma and substituting therefor a flow of a second excited plasma comprising an activated gas selected from the group consisting of oxygen and nitrogen over said substrate; and then

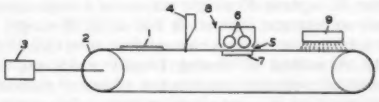
elevating the temperature of said substrate to cause the hydrogen to diffuse-out from said porous a-Si_xH_y film, each departing hydrogen atom leaving behind a dangling Si bond which combines with an excited radical of the activated gas in said second plasma thereby to form said dielectric film of formula Si_xM_y, where M represents either oxygen or nitrogen, depending on the identity of said activated gas.

4,289,798

METHOD FOR REDUCING SURFACE GLOSS

George E. Bagley; Willard E. McCreary, and Werner Ruegeberg, all of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Apr. 14, 1980, Ser. No. 140,102
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—39 **10 Claims**



1. A method for producing a radiant energy cured resinous coating having a reduced gloss level, wherein said coating does not require the presence of flatting pigments to achieve gloss reduction, which method comprises:

(a) coating the surface of a substrate with a liquid resinous coating composition curable by radiant energy;

(b) treating at least a portion of the surface of the liquid resinous coating with a corona discharge sufficient to reduce the gloss level of the coating in the treated portion; and

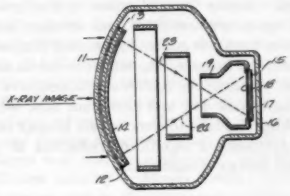
(c) exposing the liquid resinous coating having a reduced gloss level to a dosage of radiant energy sufficient to polymerize the coating and set the reduced gloss level.

4,289,799

METHOD FOR MAKING HIGH RESOLUTION PHOSPHORESCENT OUTPUT SCREENS

Walter P. Sarvas, Waukesha, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 31, 1980, Ser. No. 135,558
Int. Cl.³ H01J *29/18*; G21K *4/00*
U.S. Cl. 427—65 **8 Claims**



1. A method of making phosphorescent screens comprising the steps of:

coating a substrate with a slurry composed of substantially uniformly fine phosphor particles having a first degree of fineness suspended in a thermoplastic fluid,

spinning said substrate to remove any excess slurry and to reduce the coating to the thickness desired, and permitting said thermoplastic fluid to set,

heating said substrate and the coated layer formed as aforesaid until the thermoplastic softens or begins to melt,

pressing onto said softened thermoplastic with a fine low durometer sponge more phosphor having said first degree of fineness and removing any excess phosphor particles which are not adhered,

heating said substrate and the coating thereon to drive out the volatile constituents of the thermoplastic,

depositing on said coating another coating of slurry composed of substantially uniformly fine phosphor particles having a second degree of fineness, which is more coarse that the first, suspended in a water and silicate mixture, and centrifuging the substrate to reduce said other coating to the desired thickness,

drying said other coating, applying a thin coating of lacquer over said other coating and letting the lacquer dry,

depositing a thin aluminum layer on said lacquer, and

heating the coated substrate to drive off the volatile constituents of said lacquer.

4,289,800

METHOD FOR PROVIDING AN ELECTRICALLY CONDUCTIVE BRIDGE IN CATHODE RAY TUBES

Ricky H. Shah, Glendale Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Division of Ser. No. 86,907, Oct. 22, 1979. This application Jul. 18, 1980, Ser. No. 170,206

Int. Cl.[3] **H01J** *29/06*

U.S. Cl. 427—68 **8 Claims**

1. For use in the manufacture of a color cathode ray picture tube, a method for providing an electrically conductive bridge between a high-voltage-charged shadow mask held dependent adjacent to the phosphor-layered faceplate of said tube by a plurality of metallic suspension members extending from said faceplate, and an aluminum film overlayed on a lacquer deposited on said phosphor layer, the method being of the type including the steps of:

(a) baking said tube to drive off said lacquer by oxidation;

(b) providing a bake-hardenable water-soluble solution that is electrically conductive when hardened;

(c) painting on said solution to form said bridge between said suspension members and said mask, and said aluminum film;

an improvement which comprises;

in lieu of step (b), providing a bake-hardenable solution which comprises a mixture of substantially equal parts of glass frit particles and graphite particles in the micron-sized range, said particles being in suspension in an evaporable solvent for said lacquer, said suspension including a thickening agent in an amount sufficient to produce a paintable viscosity for application by brush means;

such that upon application of said solution between said suspension members and said aluminum film, said solution penetrates said lacquer film, and when baked, said solution provides a permanent electrically conductive bridge between said mask and said aluminum film, whereby step (a)—baking said tube to remove said lacquer can be eliminated, providing a significant reduction in production costs and energy consumption.

4,289,801

METHOD FOR PRODUCING FINE GRAINED PYROLYTIC SILICON NITRIDE

Francis S. Galasso, Manchester, Conn., and Malcolm Basche, deceased, late of West Hartford, Conn. (by Joyce O. Basche, heir), assignors to United Technologies Corporation, Hartford, Conn.

Filed May 21, 1980, Ser. No. 149,820

Int. Cl.[3] **C01B** *21/06;* **B05D** *5/12*

U.S. Cl. 427—94 **6 Claims**

1. A method for producing fine grain pyrolytic silicon nitride which comprises:

providing reactant gases which comprise from 40 to 90% ammonia, balance silicon halide and an amount of methane equal to from about 50 to 500% of the reactant gases, mixing these gases and flowing them into a reaction chamber which contains a substrate, said reaction chamber and substrate being heated to from 1200° to 1900° C. and said reaction chamber being maintained at a partial pressure of less than 300 mm of Hg of reactant gases, so that fine grained pyrolytic silicon nitride free of carbon and having a grain size less than about 10 microns is deposited on the substrate.

4,289,802

POROUS CERMET ELECTRODE AND METHOD OF MAKING SAME

Adolph L. Micheli, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1979, Ser. No. 97,907

Int. Cl.[3] **C03C** *15/00;* **G01N** *27/26, 27/30;* **B32B** *3/00*

U.S. Cl. 427—125 **3 Claims**

1. A method of making a porous cermet electrode on a solid electrolyte substrate comprising:

coating a surface of the substrate with a slurry of noble metal particles and glass particles, the glass being annealable into an immiscible and leachable borate phase;

heating the coated substrate at a first temperature to fuse the glass and bond it to the noble metal particles and to the substrate;

heating the coated substrate at a second and lower temperature for a sufficient duration to form an interconnected network of the borate phase leachable from a second glass phase within which it is dispersed; and

leaching the borate phase from the other glass phase, effective to produce a porous matrix throughout which said noble metal particles are exposed.

4,289,803

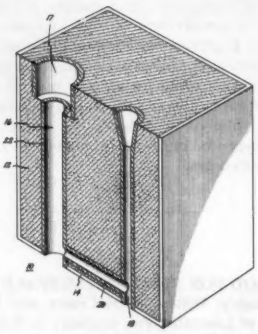
FOUNDRY MOLD TREATING COMPOSITIONS AND METHODS OF MAKING SAME

Wayne F. Wales, Clifton Park, and James J. Frawley, Loudonville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 68,193, Aug. 20, 1979, abandoned. This application Jun. 9, 1980, Ser. No. 158,065

Int. Cl.[3] **B28B** *7/38;* **B29C** *1/04*

U.S. Cl. 427—134 **22 Claims**



1. A phosphosilicate composition useful for treating foundry molds and products, comprising an admixture of from about 5 to about 55 weight percent colloidal silica sol containing at least 15 percent SiO_2; from about 2 to about 60 weight percent of an alkyl silicate containing at least 28 percent SiO_2; from about 20 to about 40 weight percent of a water-miscible organic solvent, and from about 5 to about 45 weight percent phosphoric acid having a concentration of at least 50 percent.

17. A method of treating foundry molds and products formed of compacted comminuted refractory materials, comprising coating at least a predetermined surface portion of the surface to be treated with a hybrid silicate followed by application to the surface so treated of a mixture of about 50–90 percent of a high concentrate phosphoric acid and approximately 10–50 percent water miscible alcohol to form a silicyl metaphosphate on the surface so treated.

4,289,804

PROCESS FOR TREATING METAL HANDLING AND SHAPING DEVICES

Micheal D. Labate, 115 Hazen Ave., Ellwood City, Pa. 16117

Continuation-in-part of Ser. No. 59,968, Jul. 23, 1979, abandoned. This application Aug. 13, 1980, Ser. No. 177,650

Int. Cl.[3] B44D *1/092;* B22D *41/00*

U.S. Cl. 427—135 10 Claims

1. A process of treating metal handling and shaping devices that consists essentially of the steps of cleaning said devices to the bare metal, penetrating a liquid suspension of submicron sized particles of graphite into said bare metal of the devices, said liquid suspension including at least 5% of 25% submicron sized particles of graphite, applying enough of said liquid suspension of graphite to build up smooth adhering and lubricating coating on said metal portions and building up sufficient excess of graphite on said devices to form a slick smooth surface, the size of said submicron particles of graphite being no larger than as determined by electron microscopy.

4,289,805

METHOD FOR SEALING POROSITY LEAKS IN PNEUMATIC TIRES

Jerome Dubow, North Wales, Pa., assignor to Stop-A-Flat Corporation, Huntingdon Valley, Pa.

Filed Jul. 26, 1979, Ser. No. 60,967

Int. Cl.[3] B29H *9/02;* B32B *25/02, 25/04;* B05D *7/22*

U.S. Cl. 427—140 2 Claims

1. A method for sealing porosity openings in a pneumatic tire having an interior chamber which comprises the steps of

introducing into the interior tire chamber an aqueous sealing solution containing a butyl latex emulsion and natural fibers;

inflating the tire;

rotating the inflated tire and forming a film of the sealing solution over the interior chamber;

flowing portions of the sealing solution into the porosity openings;

rotating the tire over a surface and creating frictional heat; and

utilizing the frictional heat to dry the portions of the sealing solution within the porosity openings and effecting sealing closure of the said openings.

4,289,806

PRESSURE-SENSITIVE RECORDING MATERIAL

Atsushi Sato, Tokyo; Isoo Shimizu, Yokohama, and Eiichi Matsuzaka, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Jan. 24, 1980, Ser. No. 114,994

Claims priority, application Japan, Jan. 27, 1979, 54-7689; Jan. 27, 1979, 54-7690

The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.

Int. Cl.[3] B41M *5/16, 5/22*

U.S. Cl. 427—150 12 Claims

1. A method of producing pressure-sensitive recording material wherein a sheet material is coated with pressure rupturable microcapsules containing therein a solution of dyestuff in a solvent fraction, the main components of which are chosen from the group consisting of non-condensed bicyclic and tricyclic aromatic hydrocarbons, having a boiling range (converted to atm. press.) of 265° to 360° C., which comprises treating a raw material fraction in the presence of an acid catalyst and under the conditions of liquid phase, 0.1 to 5 hours in contact time, and 10% by weight or less in concentration of monocyclic aromatic olefins contained in the material fed to the reaction vessel, said raw material fraction being obtained from the product of thermal cracking of petroleum hydrocarbons at a temperature of 700° C. or above and mainly containing the distillate having boiling points in the range of 75° C. to 198° C. and the main components thereof being monocyclic aromatic hydrocarbons (excluding aromatic olefins) each having 6–10 carbon atoms and monocyclic aromatic olefins.

4,289,807

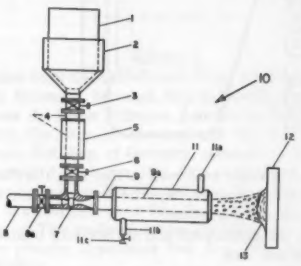
FUSION PROCESSING OF SYNTHETIC THERMOPLASTIC RESINOUS MATERIALS

Marvin M. Christensen, Baton Rouge; Richard E. Zachary, Clinton, and Andra P. Dupont, Plaquemine, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1980, Ser. No. 126,619

Int. Cl.[3] B05B *1/00;* B05D *1/02;* B05B *1/24;* B05D *1/12*

U.S. Cl. 427—195 10 Claims



1. An apparatus for the fusion processing of a particulate synthetic thermoplastic resinous material comprising, means for providing a first stream of high-velocity gas; means for entraining the particulate synthetic thermoplastic resinous material in the first stream of gas; an elongated passageway for transporting the first stream of gas and entrained resinous material, the passageway being defined by at least one wall having a plurality of formamina or small pores therethrough and throughout substantially the length thereof; means for providing and passing a second stream of heated gas through the foraminous wall into the passageway, said second stream having sufficient velocity uniformly through the wall to provide a slip stream next to the passageway surface of the wall thereby minimizing sticking of the resinous material to the passageway surface of the wall, said wall terminating at an exit opening for expelling the first and second streams of gas and entrained resinous material from the apparatus; and a workpiece against which the entrained resinous material is directed, thereby fusing the resinous material.

4,289,808

PROCESS FOR PRODUCING DRY FINISHED PAPERBOARD

Denis K. Huang, Laurel, Md., assignor to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 926,075, Jul. 19, 1978, abandoned. This application Dec. 12, 1979, Ser. No. 102,743

Int. Cl.[3] B05D *1/00*

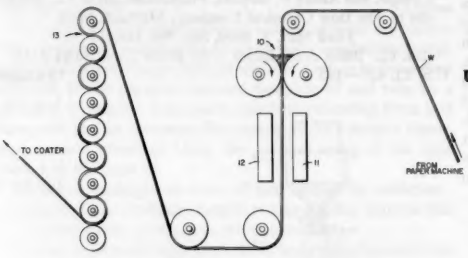
U.S. Cl. 427—209 1 Claim

1. A process for producing a dry finished, coated paperboard web to attain a smoothness and printability equivalent to that of a wet finished product without any significant loss of caliper comprising:

(a) applying a surface sizing composition with a surface sizing applicator to at least one side of the paperboard web before calendering and coating, said surface sizing composition comprising a binder, pigment in the ratio of from about 1:1 to 1:1.5 based on the weight of the binder and from about 5–20% based on the weight of the binder of a low molecular weight polyhydroxy alcohol plasticizing agent having a boiling point greater than about 100 degrees C. selected from the group consisting of glycerine, glycerol, glycol, propylene glycol, diethylene glycol, triethylene glycol, trimethylene glycol and glycide, the

solids content of said surface sizing composition being from about 4–32%, wherein the total pickup at the size-press ranges from about 0.75 to 3.5 lb/ream/side in such a manner that the plasticizing agent remains substantially on the surface of the paperboard;

(b) machine calendering the surface sized paperboard in the



absence of a water treatment so that only the plasticizing agent containing surface layer of the paperboard becomes compacted and smoothed;

(c) coating the calendered and surface size treated paperboard surface; and,

(d) drying the thus treated paperboard to produce a dry finished web.

4,289,809

POLYDENTATE PHOSPHONIUM SALTS USEFUL IN TREATING GLASS AND CAPILLARY CHROMATOGRAPHIC COLUMNS

Sean G. Traynor, and George Marcelin, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 14,131, Feb. 22, 1979, Pat. No. 4,209,554. This application Sep. 10, 1979, Ser. No. 65,588

Int. Cl.[3] **C07F** *9/54;* **B01D** *53/04, 15/08*

U.S. Cl. 427—230 **12 Claims**

1. Polydentate phosphonium salts comprising the reaction product of:

(a) a polydentate phosphine containing two or more trivalent phosphorus atoms selected from the group consisting of:

(1) $R_1R_2PAPR_1R_2$;

(2) $(R_1R_2PA)_3P$;

(3) $[(R_1R_2PA)_3P]\ (R_1R_2PA)_2PR_3$;

(4) $(R_1R_2PA)_2PAP(APR_1R_2)_2$; and

$$(5)\ R_1R_2P{-}(AP)_{\overset{|}{R_3}}{-}APR_1R_2$$

wherein R_1, R_2 and R_3 are the same or different C_{1-20} alkyl radical, or an aromatic radical containing up to twelve carbon atoms and A represents a straight chain or branched lower alkylene radical containing from 2 to 6 carbons; n is an integer from 1 to 6; and

(b) a mono or difunctional alkyl or aralkyl halide capable of forming a quaternary salt selected from the group consisting of (1) R_4X; (2) ArR_5X; (3) XR_6X; and (4) XCH_2ArCH_2X wherein X is halogen; R_4 is an alkyl radical containing up to 20 carbon atoms; R_5 is a lower alkylene radical containing 2 to 6 carbon atoms; Ar is a mono or divalent aryl radical which may contain one or more halogen ring substituents, provided that when the polydentate phosphine is $R_1R_2PAPR_1R_2$, the halide used to form the quaternary salt must be a difunctional alkyl halide or an aralkyl halide.

4,289,810

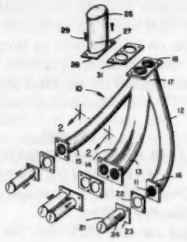
IN-SITU CAVITY COATING METHOD

King D. Eng, Fishkill, N.Y.; John T. Brandenburg, Port Neches, Tex.; Kung-You Lee, and Matthew A. McMahon, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 26, 1979, Ser. No. 78,869

Int. Cl.[3] **B05D** *7/22, 3/02*

U.S. Cl. 427—230 **11 Claims**



1. Method for depositing a coating layer of material onto interior surfaces of a body which defines an internal cavity having a gas pervious matrix substrate substantially occupying said cavity, the latter having at least one opening, which method includes the steps of:

initially inserting into said internal cavity a charge comprising a solid reaction component which, when mixed with a sufficient amount of a liquid component, will form a liquid coating solution having a desired molar concentration,

closing said at least one cavity to form a vented, liquid holding chamber within the cavity,

introducing into said liquid holding cavity said sufficient amount of liquid component to contact said reaction component thereby to form the coating composition having the desired molar concentration,

and maintaining said coating composition within said cavity for a sufficient period of time to deposit a coating layer on surfaces within the cavity.

4,289,811

STABLE AQUEOUS DISPERSIONS OF MIXED RESINS AND PROCESS FOR USE AS COATING COMPOSITIONS

Ralph R. Shelley, Jr., Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 21, 1980, Ser. No. 123,136

Int. Cl.[3] **B05D** *7/22*

U.S. Cl. 427—239 **17 Claims**

16. A method for protecting the surface of an article of manufacture which comprises applying to the surface a coating of a stable aqueous dispersion of heat-curable mixed resins, and heat-treating the coating to form an adherent thermoset film on the surface of the article, wherein the said stable aqueous dispersion coating composition is prepared by a process which comprises the steps of (1) preparing a solution of an aminoplast in a substantially water-miscible organic solvent; (2) heating the solution and adding thereto a mixture of vinyl polymerization catalyst and α,β-olefinically unsaturated carboxylic acid monomer and at least one other vinyl polymerizable monomer to form a polymerization product solution wherein the unsaturated monocarboxylic acid monomer is present in the amount of about 20 to about 90 weight percent based on total monomer weight; (3) admixing and heating together the polymerization product solution and an epoxy resin; (4) at least partially neutralizing the admixture with ammonia or an organic amine; and

(5) dispersing the admixture into an aqueous medium to provide a stable aqueous dispersion of mixed resin solids having a solids content in the range of between about 15 to about 40 weight percent wherein the aminoplast component is present in the amount of about 1 to about 12 weight percent, the monomers are present in the amount of about 20 to about 40 weight percent and the epoxy resin component is present in the amount of about 48 to about 79 weight percent, said weight percents being based on the total weight of aminoplast, monomers and epoxy resin components.

4,289,812

METHOD OF WATER-SOLUBILIZING HIGH PERFORMANCE POLYETHER EPOXIDE RESINS, THE SOLUBILIZED RESINS AND THERMOSET, HYDROPHOBIC COATINGS DERIVED THEREFROM

Patrick H. Martin, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

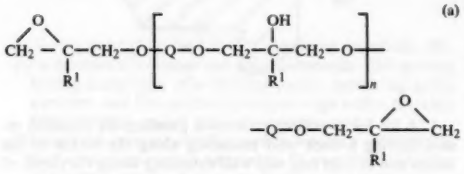
Continuation-in-part of Ser. No. 853,168, Nov. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 753,765, Dec. 23, 1976, abandoned. This application Mar. 12, 1979, Ser. No. 19,958

Int. Cl.³ B05D *3/02;* **C08L** *63/00*

U.S. Cl. 427—379 **34 Claims**

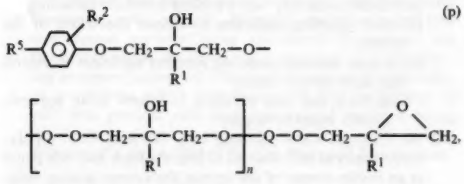
1. A process for making water-thinnable, base-neutralized, acidic resins which are convertible to hydrophobic, high performance, thermoset resins, said process comprising:

(I) reacting orthophosphoric acid with a polyether epoxide resin E^1 consisting essentially of molecules of the formula



(a)

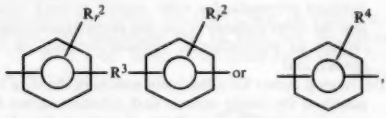
or



(p)

wherein

Q, independently, in each occurrence, is



n is an integer of from 0 to 40, r is zero, 1 or 2 and, independently in each occurrence;

R^1 is H, methyl or ethyl,

R^2 is —Br, —Cl or a C_1 to C_4 alkyl or alkenyl group,

R^3 is a C_1–C_4 alkylene or alkenylene group,

$>C(CF_3)_2$, —CO—, —SO_2—, —S—, —O— or a valence bond,

R^4 is —Br, —Cl or a C_1 to C_4 alkyl or alkenyl group; and

R^5 is H or alkyl of 1 to 12 carbons,

said reaction being carried out by contacting E^1 with an orthophosphoric acid source material and from 0 to about 25 molecular proportions of water per molecular proportion of H_3PO_4 provided by said source material, until the fraction of the oxirane groups in E^1 converted is such that when the resulting product is at least partially salified with a base, an aqueous dispersion which contains essentially no co-solvents or dispersing agents can be formed from it,

the amount of orthophosphoric acid included as such in said source material, or obtainable therefrom by hydrolysis, being such as to provide from about 0.3 to about 2.8 P-OH hydroxyl groups per oxirane group, and

(II) salifying the resultant reaction product with at least sufficient of a base to render it water-thinnable.

4,289,813

PROCESS FOR COATING SOLVENT-FREE LACQUERS

Freidrich Blomeyer, deceased, late of Schildgen, Fed. Rep. of Germany (by Agnes Blomeyer, heiress); Gerhard Mennicken, Opladen, Fed. Rep. of Germany, and Walter Uerdingen, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 616,108, Sep. 23, 1975, abandoned, which is a continuation of Ser. No. 438,049, Jan. 30, 1974, abandoned. This application Jan. 25, 1980, Ser. No. 115,463

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1973, 2304893

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—385.5 **9 Claims**

1. In a process for coating substrates with polyurethane forming lacquers and curing the coating, the improvement wherein a lacquer binder is used which has a solvent-free viscosity of 20 to 100 DIN seconds in DIN cup 4 measured according to DIN 53211 and comprises

(a) a polyisocyanate component consisting essentially of a polyisocyanate or polyisocyanates having only aliphatically bound isocyanate groups,

(b) a high molecular weight polyhydroxy component consisting essentially of a polyhydroxy compound or compounds which have molecular weights between 200 and 2000 and do not contain ether groups, and

(c) 10 to 30 percent by weight, based on the total quantity of binder, of a low molecular weight component comprising monohydric and/or polyhydric alcohols with molecular weights below 200,

wherein said components are present in quantities corresponding to an NCO to OH ratio of between 0.8:1 to 1.2:1.

4,289,814

STABILIZED PHENOLIC RESINS

C. Eugene Jinkins, Freeport, and Bobby Legler, Lake Jackson, both of Tex., assignors to The Dow Chemical Co.

Division of Ser. No. 5,738, Jan. 23, 1979, Pat. No. 4,235,762. This application May 12, 1980, Ser. No. 149,089

Int. Cl.³ B05D *7/26;* **C08L** *61/10*

U.S. Cl. 427—385.5 **8 Claims**

1. A method of preparing a coating from a stabilized phenolic resole resin composition of a phenolic resole resin and an amount of a finely divided, water absorbent powder having a number average particle size of less than about 5,000 Å sufficient to reduce the amount of a distinct, water rich phase formed in the phenolic resole resin; said method comprising the steps of:

(a) adding a catalytic amount of an acid to the stabilized resole resin composition;

(b) applying the catalyzed resole resin composition to a suitable substrate; and

(c) subjecting the catalyzed resole resin composition to conditions sufficient to cure the resin on the substrate.

4,289,815

COLD WATER-INSOLUBLE POLYVINYL ALCOHOL POUCH FOR THE CONTROLLED RELEASE OF ACTIVE INGREDIENTS

Ping I. Lee, Valley Cottage, N.Y., assignor to Airwick Industries, Inc., Carlstadt, N.J.

Continuation-in-part of Ser. No. 919,120, Jun. 26, 1978, abandoned. This application May 4, 1979, Ser. No. 35,369

Int. Cl.[3] **B65D** *1/20, 11/20*

U.S. Cl. 428—35 **12 Claims**

1. A sealed pouch for the controlled release of chlorinating agent into an aqueous medium having a maximum of 60° C. consisting of an envelope of cold water insoluble polyvinyl alcohol in film form, said polyvinyl alcohol being at least about 99% hydrolyzed and having a minimum degree of swelling in water of about 120%, and enclosed therein an effective amount of a chlorinating agent having at least a minimum solubility in water, the pH of said aqueous solution of chlorinating agent being in the range of from 2.5–10.0; said sealed pouch having a maximum ratio of weight of active ingredient to pouch volume of about 50 lb/ft^3.

4,289,816

PROCESS FOR IMPROVED GLASS ARTICLE COATING, AND SUCH COATED ARTICLES

Clement V. Fogelberg, Arvada, and Joseph H. Romig, Boulder, both of Colo., assignors to LAM Partnership, Denver, Colo.

Continuation-in-part of Ser. No. 911,017, May 30, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 126,584

Int. Cl.[3] **B05D** *3/02;* **C03C** *17/23, 17/32*

U.S. Cl. 428—35 **43 Claims**

1. A method for forming protective coatings upon glass articles comprising:

positioning a glass article heated to an elevated temperature within a coating location;

applying an aqueous solution of a coating compound selected from the group consisting of magnesium compounds, zinc compounds and mixtures thereof upon the surface of the heated glass article;

evaporating the solvent from the solution at the surface of the glass article;

pyrolytically decomposing the remaining compound at the surface of the glass article to form a continuous, adherent and substantially transparent coating of the coated compound metal oxide upon the surface of the glass article;

cooling the glass article and metal oxide coating thereon; and

applying a second, lubricious coating thereto at a lower temperature.

4,289,817

DECORATED MULTILAYERED HOLLOW PLASTIC CONTAINER

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation of Ser. No. 5,957, Jan. 24, 1979, abandoned, which is a continuation of Ser. No. 632,308, Nov. 17, 1975, abandoned, which is a division of Ser. No. 488,728, Jul. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 477,751, Mar. 21, 1973, Pat. No. 3,939,239, which is a continuation-in-part of Ser. No. 343,498, Mar. 21, 1973, abandoned, which is a division of Ser. No. 186,984, Oct. 6, 1971, Pat. No. 3,787,157, which is a division of Ser. No. 71,734, Sep. 14, 1970, Pat. No. 3,717,544, which is a continuation-in-part of Ser. No. 100,050, Dec. 21, 1970, Pat. No. 3,719,735. This application May 16, 1980, Ser. No. 150,325

Int. Cl.[3] **B65D** *11/16;* **B32B** *3/00*

U.S. Cl. 428—35 **4 Claims**

1. An open neck, blow molded multilayered hollow plastic container exhibiting the characteristics of blow orientation having an outer, pressure molded first portion of a transparent plastic material and a drawn inner second portion of plastic material having substantially continuous side and end walls and an open ended neck, wherein the inner portion is colored so that said color is visible through the molded plastic, said outer pressure molded first portion having substantially continuous

side and end walls and an open neck conforming to the side and end walls and open ended neck of said inner portion.

4,289,818

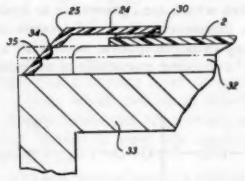
EXTRUDED WALL PANELING SYSTEM

Jorge Casamayor, Columbus, Ohio, assignor to Plaskolite Inc., Columbus, Ohio

Filed Mar. 1, 1979, Ser. No. 16,482

Int. Cl.[3] **A47K** *3/14;* **E04B** *1/343*

U.S. Cl. 428—43 **9 Claims**



1. A kit for providing protective paneling for a walled recess, having a back wall extending along the width of the recess and at least one side wall extending along the depth of the recess, the kit including

1. paneling members co-extruded from at least two different polymeric materials, said paneling members including
   (a) back paneling sufficient to extend the width of the recess;
   (b) at least one side paneling member sufficient to extend the depth of the recess;
   said back and side paneling members being approximately equal in height;
2. At least one corner joining strip extruded from a polymeric material and adapted to join the back and side panel at an inside corner of the recess, the corner joining strip:
   (i) consisting of a pair of rigid side portions each of which normally obtusely extends integrally from a substantially rigid laterally extensive central portion,
   (ii) being cross-sectionally symmetrical and having side portions perpendicular with respect to each other so that the outer surfaces of the side portions coincide with respect to perpendicular surfaces forming an inside corner, and
   (iii) having means for adhesively attaching the strip to the panels at the inside corner, said adhesive means being applied to the outer surfaces of each of the obtusely extending side portions;
3. at least one edge sealing strip extruded from polymeric material and adapted to protectively overlap the terminal edge of the at least one side panel applied to the wall,
   (i) said edge strip having two substantially rigid longitudinally extending portions in a lateral normally obtusely angled relationship,
   (ii) said strip including on one portion, on the inward facing surface of the obtuse angle, adhesive means for attachment of the strip to the outermost surface of the side panel at the extending terminal edge thereof,

(iii) said strip being further adapted to provide an adjustable overlap with respect to the terminal edge of a panel and an existing wall surface by means of one of: (A) a resilient hinge portion connecting and being co-extensive with the two rigid longitudinally extending portions; and (B) means for separation of a longitudinal end segment from the width of the other portion of the strip, said means consisting of at least one of (1) a longitudinal breaking groove and (2) a narrow longitudinally extending dividing stripe consisting of co-extruded flexible polymeric material of a softer durometer than the durometer of the polymeric material from which the rigid portions are formed, the said one of a breaking groove and dividing stripe being adapted to allow the separation of a longitudinal end segment from the portion.

4,289,819

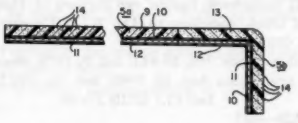
STEP TREAD PLATE

James H. Kalman, 1001 City Ave., Philadelphia, Pa. 19151

Continuation of Ser. No. 7,114, Jan. 29, 1979, abandoned. This application Feb. 29, 1980, Ser. No. 125,842

Int. Cl.³ B32B *3/00;* **B61D** *32/00*

U.S. Cl. 428—57 **8 Claims**



1. A step tread plate for vehicles consisting essentially of:

(a) a substantially planar and integral metallic first portion having a top layer of a resilient plastic containing gritty particles, said first portion having an edge with a plurality of projections spaced from one another, and

(b) a second, integral metallic portion having a substantially L-shaped cross-section adapted to fit over the front edge of the step when in place, part of said second portion being disposed substantially horizontal and co-planar with said first portion and having a top layer of a resilient plastic containing gritty particles, the gritty particles in said first and second portions being distributed throughout the thickness of said top layers, said second portion also having an upper horizontal longitudinal edge with a plurality of projections which intermesh with the projections of said first portion, said first and second portions being highly contrasting in color with said second portion being substantially more light-reflective than said first portion.

4,289,820

FUSED BELT LOOP STRIPS

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Continuation-in-part of Ser. No. 79,977, Sep. 28, 1979, Pat. No. 4,259,131. This application Jun. 12, 1980, Ser. No. 158,646

Int. Cl.³ B31F *1/00;* **B29C** *17/04;* **B32B** *3/04;* **E03D** *1/18*

U.S. Cl. 428—125 **6 Claims**

1. A non-frayable fabric loop comprised of an elongated fabric strip of a first material whose longitudinal edges are folded over itself and a second material, whose melting point is lower than the scorching point of the first material, and which is entirely diffused between the fibers of the fabric strip, including the folded over edges, to hold them in their folded position and to fuse together the fibers of the fabric strip to prevent fraying.

4,289,821

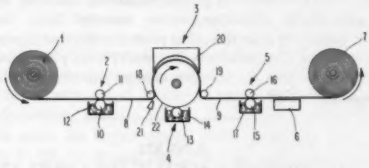
SURFACE REPLICATION ON A COATED SUBSTRATE

Lorin S. Gray, III, Portland; John A. Mattor, Bar Mills; Ben Millard, South Windham, and Franklin J. Ward, Cape Elizabeth, all of Me., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Sep. 24, 1979, Ser. No. 78,078

Int. Cl.³ B05D *3/06*

U.S. Cl. 428—172 **7 Claims**



1. A method of providing surface replication in a release coating on a substrate, comprising the steps of:

A. applying a coating of an electron beam radiation curable composition or material directly to one side of the substrate;

B. pressing the substrate and coating against a replicative surface having a desired surface effect to cause the surface of the coating opposite the substrate to conform to the replicative surface;

C. irradiating the coating with electron beam radiation through the substrate to only partially cure the coating, but at least sufficiently to enable it to be removed from the replicative surface with the replicated surface effect in the coating being maintained;

D. stripping the substrate from the replicative surface with the partially cured coating adhered to the substrate;

E. applying a further light layer of a curable coating composition compatible with the coating composition applied in step A. to the surface of the partially cured coating; and

F. curing the further coating layer while completing the cure of the first applied coating to provide improved release properties over that obtainable without the further coating layer.

6. A release sheet comprising a paper substrate and on at least one side thereof a coating of an electron beam radiation curable composition or material which has been cured by electron beam radiation passing first through the substrate, the outer surface of the coating having a desired surface effect formed by curing the coating in intimate contact with a replicative surface having the desired surface effect.

4,289,822

LIGHT-SENSITIVE FILM

Toshikazu Shimada, Hinodemachi; Yoshifumi Katayama, and Kiichi F. Komatsubara, both of Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1979, Ser. No. 48,740

Claims priority, application Japan, Jun. 26, 1978, 53/76457

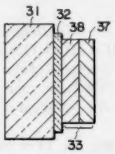
Int. Cl.³ B32B *7/12, 9/04*

U.S. Cl. 428—212 **26 Claims**

1. An article comprising a light-sensitive film constructed of at least a single layer of at least one photoconductive material on a substrate, wherein at least one layer of said at least a single layer is made of an amorphous photoconductive material

whose composition is expressed by a formula $[Si_{1-x}C_x]_{1-y}[H]_y$ where $0 \leqq x \leqq 0.3$ and $0.02 \leqq y \leqq 0.3$, whereby said light-sensitive film exhibits photoconductive characteristics.

23. An article according to claim **1**, wherein said light-sensitive film is constructed of at least two layers of at least one photoconductive material, with one of said at least two layers



made of said amorphous photoconductive material, and with the amorphous photoconductive material layer having a higher resistivity than the other photoconductive layers of said light-sensitive film, whereby the amorphous photoconductive material layer can act to store charge patterns formed in the light-sensitive film.

4,289,823

CALENDERABLE ACRYLIC POLYMERS AND TEXTILES TREATED THEREWITH

Charles T. Arkens, Hatfield, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 30, 1980, Ser. No. 192,165
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—245 **10 Claims**

1. A calenderable, soft, three-stage acrylic polymeric composition, said composition having a calculated T_g of from about (−)40° C. to about (+)20° C., the isolated and dried particles of which comprise about 30–60% by weight of a polymeric first stage, about 30–60% by weight of a polymeric second stage, and about 5–20% by weight of a polymeric third stage, wherein

(1) said first stage is formed by emulsion polymerization of a first monomer composition having a T_g of about (−)10°. or lower consisting essentially of:
  (a) about 70–95% by weight of at least one (C_1–C_8) alkyl acrylate,
  (b) about 0–15% by weight of at least one (C_1–C_8) alkyl methacrylate,
  (c) about 4–10% by weight of a latent cross-linking monomer selected from acrylamide or methacrylamide, and
  (d) about 0.5–4% by weight of at least one alpha, beta-ethylenically unsaturated carboxylic acid selected from acrylic acid, methacrylic acid, and itaconic acid;

(2) said second stage is formed by emulsion polymerization, in the presence of said first stage, of a second monomer composition having a T_g of about (−)10 to (+)60° C. consisting essentially of:
  (a) about 40–70% by weight of at least one (C_1–C_8) alkyl acrylate,
  (b) about 20–50% by weight of at least one (C_1–C_8) alkyl methacrylate,
  (c) about 4–10% by weight of a latent cross-linking monomer selected from acrylamide and methacrylamide, and
  (d) about 0.5–4% by weight of at least one alpha, beta-ethylenically unsaturated carboxylic acid selected from acrylic acid, methacrylic acid, an itaconic acid; and

(3) said third stage is formed by emulsion polymerization, in the presence of said second stage polymerization product, of a third monomer composition consisting essentially of:
  (a) about 50–100% by weight of methyl methacrylate, and
  (b) about 0–50% by weight of a comonomer selected from those comonomers copolymerizable with methyl methacrylate and having a calculated T_g of less than (−)25° C.

4,289,824

HIGH FLUID-HOLDING ALLOY RAYON FIBER MASS

Frederick R. Smith, Toms Brook, Va., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Continuation-in-part of Ser. No. 790,129, Apr. 22, 1977, Pat. No. 4,199,367, which is a continuation-in-part of Ser. No. 629,952, Nov. 7, 1975, Pat. No. 4,136,697, and Ser. No. 696,451, Jun. 11, 1976, abandoned. This application Oct. 5, 1979, Ser. No. 82,352
Int. Cl.³ D02G *3/00;* **D04H** *1/58*
U.S. Cl. 428—288 **7 Claims**

1. An article of manufacture comprising a highly fluid absorbent mass of alloy rayon staple fibers consisting essentially of a matrix of regenerated cellulose and about 10 to about 40 percent of sodium carboxymethylcellulose b.o.c., at least about three-fourths of the carboxyl groups of said carboxymethylcellulose being in sodium salt form, said fibers having a denier of about one and one-half to six; said fibers carrying a lubricating or protective finish in an amount of less than one percent, and said fibers having a fluid holding capacity of at least about 5.5 cc. per gram of fiber as measured by the Syngyna test.

4,289,825

ELASTOMERIC POLYURETHANES COATED WITH A VINYL CHLORIDE POLYMER POWDER

Edmond G. Kolycheck, Lorain, and Richard M. Herman, Elyria, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 55,943, Jul. 9, 1979, abandoned. This application Aug. 22, 1980, Ser. No. 180,193
Int. Cl.³ B32B *27/40*
U.S. Cl. 428—407 **7 Claims**

1. A composition comprising elastomeric polyurethanes in granular form coated with less than 2 weight percent of a vinyl chloride polymer powder.

4,289,826

WATER-BORNE COATING FOR METAL SURFACES

John K. Howell, Jr., North Branch, Mich., assignor to Hooker Chemicals & Plastics Corp., Madison Heights, Mich.

Continuation of Ser. No. 818,184, Jul. 22, 1977, abandoned. This application Dec. 22, 1978, Ser. No. 972,305
Int. Cl.³ C08L *61/20, 63/00;* **B05D** *3/02;* **B32B** *15/08*
U.S. Cl. 428—418 **8 Claims**

1. A process for coating a ferrous or tin surface comprising contacting the surface thereof with an aqueous composition comprising:

(a) an epoxy resin having an average molecular weight of about 900 to 2,900 and about 2.7 to 11.6 hydroxyl equivalents per mole;

(b) melamine-formaldehyde resin alkylated with at least one alcohol of from 1 to 4 carbon atoms in a weight ratio of epoxy resin:melamine-formaldehyde resin of from 2:1 to 20:1;

(c) an acid catalyst which is an ammonium salt of an anion of the formula:

$$R—O—\{CH_2CH_2O\}_mSO_3^-$$

wherein R is an alkyl or alkylaryl group of at least 10 carbon atoms and containing a saturated alkyl portion and m is in the range of about 4 to 30 in an amount sufficient to effect cross linking of the epoxy resin and melamine-formaldehyde resin;

(d) a block copolymer of general formula

$$HO(CH_2CH_2O)_a(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)_b(CH_2CH_2O)_cH$$

having an HLB in excess of 22 and a molecular weight in the range of about 5,000 to 14,000 in an amount of about 2

to 12 wt. % of the total of the epoxy and melamine-formaldehyde resin; and

(e) water, the balance,

wherein the total of the components (a), (b), (c) and (d) concentrations ranges from 5 to 85 wt. % of the aqueous composition and thereafter heat-curing the applied coating.

8. A ferrous or tin surface having thereon a coating obtained by the process of claim 1.

4,289,827

MOISTURE HARDENING ONE-COMPONENT LACQUERS AND A PROCESS FOR COATING LEATHER

Klaus Noll, Cologne; Wolfgang Speicher, Leverkusen; Josef Pedain, Cologne, and Rosemarie Schmid, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 22, 1980, Ser. No. 123,854

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908628

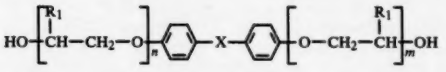
Int. Cl.³ B32B *27/40*

U.S. Cl. 428—423.4 **14 Claims**

1. Moisture-hardening one-component lacquers comprising a reaction product containing free isocyanate groups of a relatively high molecular weight polyol having an average hydroxyl functionality of from 2 to 3 and polyisocyanates, characterized in that the relatively high molecular weight polyol is a mixture comprising

(a) a hydroxyl polyester having an average molecular weight of from about 500 to 6000,

(b) a hydroxyl polyether corresponding to the following general formula:



wherein

R_1 represents hydrogen, a C_1–C_4 alkyl radical or a phenyl radical,

X represents one of the difunctional radicals —S—, —O—, —SO_2—, —CO— or

where

R_2 and R_3, which may be the same or different, represent hydrogen or a C_1–C_4 alkyl radical, and n and m each represent an integer of >0, the value of (n+m) being selected in such a way that the hydroxyl polyether has an average molecular weight of from about 300 to 1200, wherein component (b) makes up from about 3 to 30% by weight of the total quantity of the relatively high molecular weight polyol.

4,289,828

MAGNETIC RECORDING MEDIUM AND PROCESS

Hiroshi Ota, Komoro; Eiji Horigome, Saku, and Hitoshi Azegami, Tobu, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1979, Ser. No. 98,242

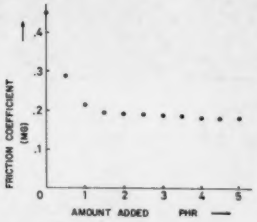
Claims priority, application Japan, Nov. 30, 1978, 53-147097

Int. Cl.³ B32B *27/40*

U.S. Cl. 428—425.9 **4 Claims**

1. In a magnetic recording medium comprising a base coated with mixture containing magnetizable particles dispersed in a curable synthetic resin binder and a polyfunctional aromatic isocyanate curing agent which functions by chemical reaction with the binder resin to produce a crosslinked product, the improvement which comprises the addition to said mixture of up to 6% by weight based on the weight of said resin binder of a sorbitan stearate dispersing agent.

3. In a process for manufacturing a magnetic recording medium which comprises preparing a liquid dispersion containing magnetic particles, a curable synthetic resin binder and



a solvent, said curable resin binder containing groups reactive with a polyfunctional aromatic isocyanate to produce a crosslinked product, adding said polyfunctional aromatic isocyanate to said dispersion, coating a base with said dispersion and curing the same, the improvement which comprises the addition of up to 6% by weight based on the weight of the resin binder of a sorbitan stearate dispersing agent.

4,289,829

METHOD FOR METALLIZING CERAMIC SUBSTRATES AND NEW, THUS OBTAINED PRODUCTS

Pierre C. Rossetti, Fontenay aux Roses, France, assignor to Silec-Semi-Conducteurs, Paris, France

Continuation of Ser. No. 845,841, Oct. 26, 1977, abandoned. This application Jun. 25, 1979, Ser. No. 52,015

Claims priority, application France, Dec. 1, 1976, 76 36243

Int. Cl.³ B32B *9/00*

U.S. Cl. 428—469 **6 Claims**

1. A method of metallizing an alumina substrate to obtain weldable metallized zones or areas thereon usable at a high temperature, said method consisting essentially in the sequential steps of:

(a) depositing on said substrate an ink composed of a dispersion of a cobalt oxide in collodion,

(b) forming a compound between said substrate and cobalt oxide, in an oxidizing atmosphere, at about 1,100° C., and thereafter

(c) reducing the oxide superficially to obtain a cobalt metal layer on which weldable metallized zones or areas may be deposited.

6. An alumina ceramic substrate comprising weldable metallized zones or areas obtained by the method of claim 1.

4,289,830

ETHYLENE-VINYL ALCOHOL COPOLYMER GAS BARRIER LAYER WITH PHENOL ADDITIVE

Jack E. Knott, II, Appleton, Wis., assignor to American Can Company, Greenwich, Conn.

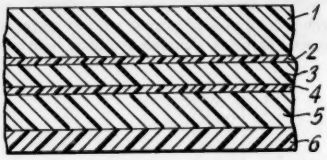
Filed Mar. 14, 1980, Ser. No. 130,229

Int. Cl.³ B32B *9/04, 27/08*

U.S. Cl. 428—475.8 **12 Claims**

3. A multi-layer packaging film structure comprising an outer structural polymer layer of nylon or a polyolefin with a modified polyolefin adhesive layer, a gas-barrier layer consisting essentially of ethylenevinyl alcohol polymer to which has

been added an orthosubstituted phenol having a melting point below about 185° C. and a boiling point above about 125° C.,



an adhesive layer of a modified polyolefin, an inner structural layer of a polyolefin, and an inside heat-sealable layer.

4,289,831

POLYOLEFIN FILMS

Anthony G. M. Last, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 30, 1979, Ser. No. 62,188

Claims priority, application United Kingdom, Aug. 18, 1978, 33910/78

Int. Cl.³ B32B *27/08;* **C09U** *7/02;* **D02G** *3/00*

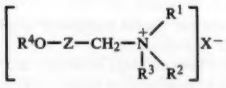
U.S. Cl. 428—515 **11 Claims**

1. A self-supporting multiple-layer film comprising:

a substrate layer of a polymer of a mono-alpha-olefin containing from 2 to 8 carbon atoms in its molecule, a modulus improver incorporated in the substrate layer,

wherein said modulus improver is a resin, of natural or synthetic origin, which is (I) amorphous, hard, brittle, and solid at ambient temperature, (II) has a softening range at elevated temperature, (III) has a drop softening point of at least 70° C., and (IV) is sufficiently compatible with the film-forming olefin polymer to yield a composition from which may be formed a drawn, self-supporting transparent film exhibiting a modulus exceeding that of a film formed from an identical olefin polymer in the absence of the improver resin,

a polymeric heat-sealable layer adhered to at least one surface of the substrate layer, and, on the surface of the heat-sealable layer remote from the substrate, an antistatic medium comprising a quaternary ammonium of general formula



wherein each of R^1, R^2, and R^3, which may be the same or different, is a hydrogen atom or a lower alkyl radical containing from 1 to 6 carbon atoms, or R^1 and R^2 are each methylene groupings within a common five- or six-membered saturated heterocyclic ring, R^4 is a hydrogen atom or an acyl radical containing up to 15 carbon atoms, Z is a methylene group or a carbonyl group when R^4 is a hydrogen atom, or Z is a methylene group when R^4 is said acyl radical, and X is a univalent anion or an equivalent of a multivalent anion.

4,289,832

CHEMICALLY-IMPREGNATED MICROPOROUS FILMS

Eckhard C. A. Schwarz, Neenah, Wis., assignor to Biax Fiberfilm Corp., Neenah, Wis.

Division of Ser. No. 780,034, Mar. 22, 1977, Pat. No. 4,153,751, and a continuation-in-part of Ser. No. 614,018, Sep. 17, 1975, Pat. No. 4,116,892, and Ser. No. 563,623, Mar. 31, 1975, abandoned. This application Oct. 26, 1978, Ser. No. 954,982

Int. Cl.³ B32B *3/12, 3/26, 3/28*

U.S. Cl. 428—542 **3 Claims**

1. An opaque low density porous sheet comprised of a chemically-impregnated biaxially stretched film of synthetic material comprised of a blend of a thermoplastic orientable polymer and an incompatible second phase selected from the group consisting of an incompatible polymer of inorganic material or a polymer matrix having an inorganic filler.

4,289,833

LIQUID PHASE SINTERED DENSE COMPOSITE BODY FOR BRAZED JOINTS AND METHOD FOR MAKING THE SAME

Takeji Hachisuka, Toyama, Japan, assignor to Kabushiki Kaisha Fujikoshi t/a Nachi-Fujikoshi Corp., Toyama, Japan

Filed Mar. 19, 1979, Ser. No. 21,976

Claims priority, application Japan, Mar. 31, 1978, 53-36697

Int. Cl.³ B22F *3/00*

U.S. Cl. 428—544 **21 Claims**

1. A liquid phase sintered dense composite metal body comprising:

a metal base layer formed by a powder mixture of at least one cementing metal and at least one hard refractory metal carbide compound, said base layer including

a multiplicity of unmelted particles of said hard refractory metal carbide compound dispersed within said metal base layer; and

a matrix layer consisting essentially of said cementing metal and a portion of said metal carbide compound diffused into said cementing metal, said matrix layer tightly cementing the unmelted particles of said hard refractory metal carbide compound; and

a continuous metal surface layer covering an entire surface of said metal base layer, said continuous metal surface layer having a chemical composition similar to that of said cementing metal, said continuous metal surface layer including

a plurality of patterned areas formed by a first plurality of metallic elements partially embedded in the surface of said metal base layer, said first plurality of metallic elements having melted and then solidified at predetermined locations in said continuous metal surface layer; and

a thin surface layer contiguously integral with all of said plurality of patterned areas, said thin surface layer being formed by the fusing together of a second plurality of said metallic elements, said metallic elements having melted and spreadingly flowed outward from said predetermined locations to cover said metal base layer.

4,289,834

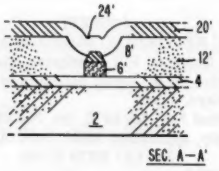
DENSE DRY ETCHED MULTI-LEVEL METALLURGY WITH NON-OVERLAPPED VIAS

George E. Alcorn, Fairfax; Raymond W. Hamaker, Catharpin, and Geoffrey B. Stephens, Catlett, all of Va., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 922,410, Jul. 6, 1978, abandoned, which is a division of Ser. No. 843,901, Oct. 20, 1977, Pat. No. 4,172,004. This application Oct. 12, 1979, Ser. No. 84,212

Int. Cl.³ B32B *3/30*

U.S. Cl. 428—601 **1 Claim**



SEC. A—A'

1. A double level metal interconnection structure having an etch-stop on the first level metal to prevent overetching thereof when forming the second level metal line in a via hole thereover, comprising:

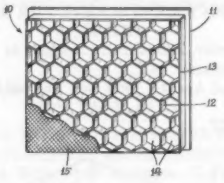
a first metal layer formed on a substrate in the shape of a conductor line;
a reactive ion etch resistant chromium metal layer formed on the surface of, aligned over and in the shape of said first layer of metal;
an insulating layer formed over said etch resistant metal layer with a via hole having a first diameter formed therethrough over said first level metal layer;
a third metal layer reactively ion etched in a pattern on said insulating layer and in said via hole said pattern having a width less than said first diameter in said via hole, electrically contacting said etch resistant metal layer;
whereby said first metal layer is protected from over-etching beneath said via hole.

4,289,835

LEAD ACID BATTERY HAVING CELLULAR MATRIX POSITIVE ELECTRODE

Tien S. Lee, Palatine; Anthony F. Sammells, and Robert J. Remick, both of Naperville, all of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 23, 1979, Ser. No. 96,787
Int. Cl.³ H01M *10/44*
U.S. Cl. 429—50 **40 Claims**



1. A lead-acid battery comprising: a container having one or more negative electrodes, positive electrodes, cell separators therebetween and an acid electrolyte therein, each of said positive electrodes comprising: an electrically conducting current collector bus plate; a honeycomb matrix structure extending from one side of said collector bus plate forming multiple positive active material compartments and having electrically conducting surfaces in electrical communication with said collector bus plate; and acid ion porous retainer means adjacent the ends of said material compartments opposite said collector bus plate and in contact with said acid electrolyte; and positive active material within said compartments and in electrical communication with said collector bus plate and said honeycomb matrix electrically conducting surfaces, said positive active material comprising lead oxide reactive material and powdered electronic conductive additive resistive to electrolyte corrosion throughout a stable acid ion porous structure, the acid ions of the electrolyte passing through said retainer means and contacting said reactive material to produce electronic flow whose conductance to said honeycomb matrix structure and said current collector bus plate is increased by said conductive additive.

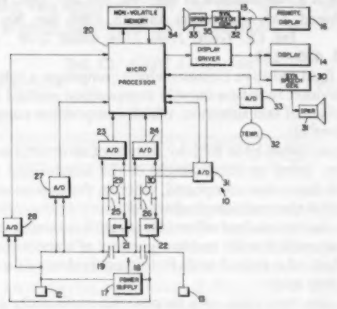
4,289,836

RECHARGEABLE ELECTRIC BATTERY SYSTEM

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Mar. 5, 1980, Ser. No. 127,400
Int. Cl.³ H01M *2/00*
U.S. Cl. 429—61 **15 Claims**

1. A rechargeable electric storage battery and a control system therefor comprising in combination:
a rechargeable cell for generating electricity,
a source of recharging electrical energy,
control means for controlling the flow of electrical energy to recharge said electric battery,
first means for sensing an operating condition of said cell,
second means for generating electrical signals indicative of the condition of said cell,
third means for receiving said electrical signals generated by said second means,
fourth means for processing said electrical signals received by said third means and generating digital signals,



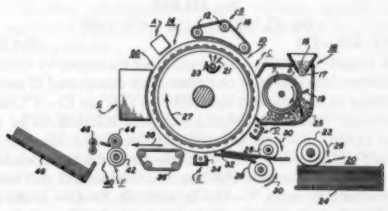
fifth means including an electronic computer for receiving said digital electrical signals, analyzing same and generating control signals, and
means for applying said control signals for operating said control means to control the flow of electrical energy to said cell for charging said rechargeable cell.

4,289,837

DEVELOPMENT METHOD AND APPARATUS

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 5, 1980, Ser. No. 146,952
Int. Cl.³ G03G *15/08*
U.S. Cl. 430—39 **22 Claims**



1. In an apparatus employing polar or polarizable toner particles for the development of a nonuniform electrostatic or magnetic latent image a development means comprising a cylindrical insulating member and concentric with and within said insulating cylinder a means for establishing convergent fields around the outer surface of said cylindrical insulating member; said means and said insulating cylinder being rotatable with respect to each other.

4,289,838

DIAZO-UNSATURATED MONOMER LIGHT SENSITIVE COMPOSITIONS

William Rowe, Westfield, N.J., and Eugene Golda, Monsey, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Continuation of Ser. No. 865, Jan. 4, 1979, abandoned, which is a continuation of Ser. No. 595,466, Jul. 14, 1975, abandoned, which is a continuation of Ser. No. 315,207, Dec. 14, 1972, abandoned. This application Aug. 13, 1980, Ser. No. 177,664

Int. Cl.[3] **G03C** *1/60, 1/54;* **G03F** *7/08*

U.S. Cl. 430—163 **8 Claims**

1. A light sensitive element which comprises: a substrate and an ultraviolet radiation curable composition applied to at least one surface of said substrate, which composition comprises the admixture of:

I. From about 10 to 95% by weight of an unsaturated monomer, based on total weight of the unsaturated monomer and diazonium compound, wherein the unsaturated monomer is the reaction product of:

A. one equivalent of an isocyanate containing intermediate which is the reaction product of i. about one equivalent of a polyol with ii. two equivalents of a diisocyanate and

B. one equivalent of a monomeric olefinically active hydrogen in the form of a hydroxyl group, said reaction product being a monomeric, solvent-free liquid containing zero percent free isocyanate groups, and

II. From about 1 to 95% by weight, based on the weight of the unsaturated monomer, of one or more solid resins selected from the group consisting of polyurethanes, epoxies, polyvinyl acetals, polyethylene oxides, polyamides, phenol formaldehydes, acrylics, ureaformaldehydes, and cellulosic resins, and

III. From about 10-95%, based on total weight of unsaturated monomer and diazonium compound of a light sensitive, negative acting diazonium compound,

whereby before light exposure said admixture is organic solvent soluble, water emulsifiable and is capable of forming a non-tacky solid film and after light exposure said admixture is not soluble in organic solvents and is non-water emulsifiable.

4,289,839

NEGATIVE IMAGE DIAZOGRAPHY FORMULATION WITH ACID LABILE COUPLER, DIAZONIUM COMPOUND AND CARBOXYLIC ACID ANHYDRIDE

Carmine A. DiPippo, Longmeadow, Mass., assignor to James River Graphics, Inc., South Hadley, Mass.

Continuation-in-part of Ser. No. 75,833, Sep. 14, 1979, abandoned, which is a continuation of Ser. No. 902,961, May 4, 1978, abandoned, which is a continuation of Ser. No. 734,975, Oct. 22, 1976, abandoned. This application Feb. 15, 1980, Ser. No. 121,883

Int. Cl.[3] **G03C** *1/54, 1/58, 1/60*

U.S. Cl. 430—177 **40 Claims**

1. A negative-working, light-sensitive diazography formulation comprising (i) at least one diazonium compound D capable of forming an organic azo dyestuff D—YOH or D—Y'OH, (ii) at least one acid labile blocked-coupler adapted to be converted in the presence of acid into an active azo-coupling species YOH or Y'OH, said blocked-coupler being chemically inert with respect to said diazonium compound D and having the structural formula Y—O—B, wherein Y—O— is the residue of said active azo-coupling species YOH and further wherein the residue —O—B is an acid labile oxygen bridged blocking moiety B defining a radical selected from the group consisting of tertiary ether, acetal, ketal and MEM ether, (iii) at least one light-sensitive acid progenitor adapted to photolytically generate an acid species capable of unblocking said blocked-coupler Y—O—B to convert same into said active azo-coupling component YOH, or rearrangement derivative Y'OH thereof, and (iv) at least one carboxylic acid anhydride adapted to inactivate, when subjected to alkaline developing conditions, unreacted diazonium compound remaining in the unexposed portions of the formulation after imagewise exposure to light.

2. A negative-working, light-sensitive diazography formulation comprising (i) at least one light-sensitive salt of a diazonium compound D capable of forming an organic azo dyestuff D—YOH or D—Y'OH, said salt being adapted to photolytically generate an acid species capable of unblocking the below blocked-coupler Y—O—B (ii) to convert same into an active azo-coupling component YOH or Y'OH, (ii) at least one acid labile blocked-coupler adapted to be converted in the presence of said acid species into said active azo-coupling component YOH or rearrangement derivative Y'OH thereof, said blocked-coupler being chemically inert with respect to said salt of said diazonium compound D and having the structural formula Y—O—B, wherein Y—O— is the residue of said active azo-coupling species YOH and further wherein the residue —O—B is an acid labile oxygen bridged blocking moiety B defining a radical selected from the group consisting of tertiary ether, acetal, ketal and MEM ether, and (iii) at least one carboxylic acid anhydride adapted to inactivate, when subjected to alkaline developing conditions, unreacted diazonium compound remaining in the unexposed portions of the formulation after imagewise exposure to light.

4,289,840

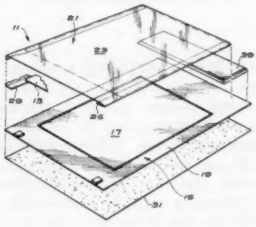
INSTANT PROCESSING SLEEVE FOR BORDERLESS PRINTS

Robert A. Sylvester, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,024

Int. Cl.[3] **G03C** *1/48*

U.S. Cl. 430—207 **8 Claims**



1. In a processing sleeve including first and second sheets coupled together in a manner suitable for receiving therebetween a diffusion transfer film sheet, the first sheet having an image-receiving section separable from a border section surrounding the image-receiving section, the improvement comprising:

a thin coupling sheet forming an outermost face of said sleeve and adhered to the image-receiving section and the border section,

said coupling sheet being separable from said border section to release the image-receiving section from said sleeve, and thereafter being separable from said image-receiving section to provide a borderless picture comprising said image-receiving section.

4,289,841

DRY-DEVELOPING PHOTOSENSITIVE DRY FILM RESIST

Abraham B. Cohen, Springfield, and Joseph E. Gervay, Red Bank, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 15,245, Feb. 26, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,300

Int. Cl.[3] **G03C** *11/12, 1/68*

U.S. Cl. 430—253 **10 Claims**

1. Dry-developing dry film resist for developing an image on

a surface by removal of unexposed area from exposed area of said resist without the use of solvent comprising a flexible support sheet and a photopolymerizable layer having a greater adhesion to said support than to said surface, but upon exposure to actinic radiation, having a greater adhesion to said surface than to said support sheet, said layer comprising (1) a dispersion of at least one polymer having a Tg below 70° C. in the form of spherical-like domains within a continuous phase of (2) at least one further polymer, the adhesion between the domains of the dispersed polymer and the further polymer being low relative to the cohesion of the continuous phase of second polymer, to provide an appreciable reduction in the cohesive strength of said layer as compared to when the dispersed polymer is not present in said layer, (3) free-radical polymerizable monomer, (4) and photopolymerization initiator for initiating the polymerization of said monomer upon exposure of said layer to actinic radiation, said monomer being present in an amount in excess of the absorptive capacity of said layer, said layer being dry developed by lamination to said surface, imagewise exposure of said layer to actinic radiation to cause the exposed area of said layer to achieve said greater adhesion to said surface, and peeling away said support sheet, the reduced cohesive strength of said layer enabling the unexposed area of said layer to break free from said exposed area and be removed therefrom by said peeling.

4,289,842

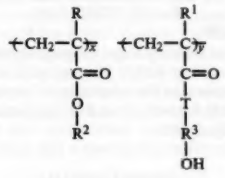
NEGATIVE-WORKING POLYMERS USEFUL AS ELECTRON BEAM RESISTS

Zoilo C. H. Tan, Rochester; Constantine C. Petropoulos, Webster, and Frederick J. Rauner, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,470
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—270 **12 Claims**

1. A polymer having a negative-working electron sensitivity of at least 2×10^{-7} coulombs/cm^2 when exposed to a 10 keV electron beam,

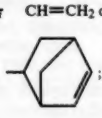
said polymer having recurring units with the sructure



wherein

R and R^1 are each independently hydrogen or methyl,

R^2 is



n is 1, 2, or 3;

R^3 is alkylene of from 1 to 3 carbon atoms;

T is —O— or —NH—; and

x and y are mole percents such that

$50 \leqq x \leqq 95$

$5 \leqq y \leqq 50$.

4,289,843

PHOTOPOLYMERIZABLE ELEMENT HAVING INITIATOR IN ADHESIVE LAYER

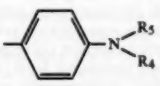
David L. Boutle, Colchester; Stuart C. Rennison, Hadleigh, and Stuart G. Lambert, Colchester, all of England, assignors to Bexford Limited, London, England

Continuation-in-part of Ser. No. 873,955, Jan. 31, 1978, abandoned. This application Nov. 21, 1978, Ser. No. 963,939
Claims priority, application United Kingdom, Nov. 29, 1977, 49610/77
Int. Cl.³ G03C *1/76, 1/68*
U.S. Cl. 430—271 **10 Claims**

1. A photopolymerisable element which comprises a self-supporting plastics film or sheet having an adhesive layer superimposed upon at least one surface thereof and a photopolymerisable layer superimposed upon the adhesive layer, said adhesive layer having a thickness of from 0.05 to 20 μm and being free of photopolymerisable component and comprising a non-photopolymerisable plastics binder and a photopolymerisation initiator comprising an admixture of:

(i) a compound having the formula:

wherein R_1 and R_2 are the same or different and are selected from hydrogen, or a lower alkyl group having up to 6 carbon atoms and R_3 is the same as or different from R_1 or R_2 and is selected from hydrogen, a lower alkyl group having up to 6 carbon atoms, a partially or completely halogenated alkyl group having up to 6 carbon atoms or a group of the formula:



in which R_5 and R_4 are the same or different and are selected from the same substituents as R_1 and R_2, said compound being present in an amount 0.01 to 2.0% by weight based upon the weight of the plastics binder; and

(ii) another photopolymerisation initiator present in an amount 0.1 to 7% by weight based upon the weight of the plastics binder.

4,289,844

PHOTOPOLYMERIZABLE COMPOSITIONS FEATURING NOVEL CO-INITIATORS

Donald P. Specht, Rochester; Conrad G. Houle, Webster, and Samir Y. Farid, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 49,661, Jun. 18, 1979, abandoned. This application Sep. 5, 1980, Ser. No. 184,606
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—281 **17 Claims**

1. In a photopolymerizable composition comprising an addition-polymerizable compound containing ethylenic unsaturation, and a co-initiator composition comprising a carbonyl compound and a photopolymerization activator responsive in the presence of the photo-excited form of said carbonyl compound to form a free radical, said activator being selected from the group consisting of an amine other than a 3-ketocoumarin,

an acetic acid derivative, a phosphine, a phosphite, a bismuthine, an arsine, a stibine, a sulfinic acid, a sulfinic acid ester, a sulfone, a dicarbonyl, a ketone, a bi-imidazole, and a stannate;

the improvement wherein said carbonyl compound is a coumarin having an absorption maximum between about 250 and about 550 nm and a

substituent in the 3-position, wherein R^1 is alkyl or alkenyl having 1 to about 12 carbon atoms, or a carbo-cyclic or heterocyclic group having about 5 to about 20 nuclear carbon and hetero atoms, said coumarin and said activator being present in an amount sufficient to provide, when the composition is coated, dried and exposed to a medium-pressure mercury light source, a speed which is at least about one-fifth that of the same composition coated, dried and exposed identically except with a co-initiator consisting of Michler's ketone and benzophenone.

4,289,845

FABRICATION BASED ON RADIATION SENSITIVE RESISTS AND RELATED PRODUCTS

Murrae J. S. Bowden, Summit, and Larry F. Thompson, Gillette, both of N.J., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed May 22, 1978, Ser. No. 907,873
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—296 **29 Claims**

1. Process for fabrication of an article comprising an operation during which the article undergoing fabrication comprises an article surface and an overlying actinic processing layer, said processing layer comprising a phase compatible blend including polymeric material, said process including the steps of (1) selectively exposing portions of the said processing layer to patterning actinic radiation whereby a difference in ease of removal of exposed portions relative to unexposed portions of the said processing layer by a developing agent is effected; (2) developing by treating the said processing layer with said developing agent to selectively remove material, thereby producing a patterned processing layer said pattern being defined by regions of the said processing layer within which material is selectively removed; (3) treating the article undergoing fabrication with an altering agent which preferentially alters regions of the said article surface corresponding with said regions of the patterned processing layer, relative to regions of the said article surface corresponding with the remainder of the said patterned processing layer, CHARACTERIZED IN THAT the said phase compatible blend comprises a "matrix polymer" determinative of the characteristics of the said remaining regions of the patterned processing layer together with a modifier which is the part of the blend primarily responsive to actinic radiation which responds to radiation primarily via a self-propagating reaction initiated by the said radiation to effect the said relative ease of removal, in which the blend is positive acting so that self-propagating reaction initiated by the said radiation increases relative ease of removal and in which the modifier is a polymer which is less soluble in the said developing agent than is the matrix polymer so that the blend, in turn, is less soluble in the developing agent wherein actinic radiation results in depolymerization to permit selective removal of modifier in irradiated portions of the said processing layer.

4,289,846

PROCESS FOR FORMING LOW-REACTANCE INTERCONNECTIONS ON SEMICONDUCTORS

Earl L. Parks, and Simon A. Zaidel, both of Liverpool, N.Y., assignors to General Electric Company, Syracuse, N.Y.

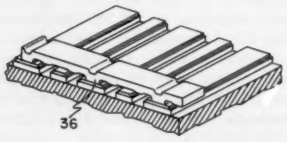
Filed Dec. 28, 1979, Ser. No. 108,064
Int. Cl.³ H01L *21/288*
U.S. Cl. 430—314 **3 Claims**

1. A method of forming a conductive bridge connecting selected ones of a plurality of thin film conductors located on a substrate comprising:

A. applying a layer of photosensitive material to the conductors and the substrate, said layer being of a thickness equal to the desired height of the bridges;

B. selectively exposing and developing the photosensitive material to effect uncovering of a contact region of each of the selected conductors with which the bridge is to come in contact;

C. depositing a layer of conductive material onto the photosensitive material and the contact regions, said layer being



of sufficient thickness to form an electroplating electrode;

D. applying a layer of photosensitive material onto the layer of conductive material, said layer being of sufficient thickness to prevent electroplating therethrough;

E. selectively exposing and developing the last applied layer of photosensitive material to effect uncovering of the conductive material spanning the contact regions;

F. utilizing the conductive material as an electrode and electroplating the uncovered surface areas thereof to the desired bridge thickness to form the bridge; and

G. removing the remaining photosensitive material and the unplated conductive material.

4,289,847

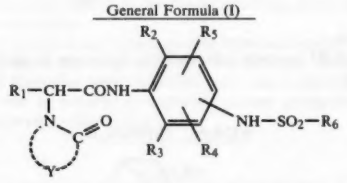
METHOD OF FORMING DYE IMAGE

Wataru Ishikawa; Mitsuto Fujiwhara; Tamotsu Kojima; Takaya Endo, and Katsunori Kato, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

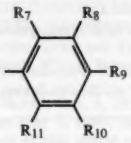
Continuation of Ser. No. 4,768, Jan. 19, 1979, abandoned. This application Jul. 21, 1980, Ser. No. 170,770
Claims priority, application Japan, Jan. 20, 1978, 53-5666
Int. Cl.³ G03C *7/00*
U.S. Cl. 430—389 **9 Claims**

1. A method of forming a dye image, comprising: processing a light-sensitive silver halide photographic material after its imagewise exposure in the presence of a compound of the following general formula (I) and an aromatic primary amine color developing agent:

General Formula (I)



wherein R_1 represents cyano, alkyl carbonyl, phenylalkyl carbonyl, phenoxy alkyl carbonyl, phenylthio alkyl carbonyl, arylcarbonyl, alkyl phenyl carbonyl, alkoxy phenyl carbonyl, R_2, R_3, R_4, and R_5 independently are hydrogen, halogen, alkyl, alkoxy, aryloxy, alkylacyloxy, arylacyloxy, acylamino, N-alkyl carbamoyl, N-phenylcarbamoyl, alkylsulfonamido, arylsulfonamido, N-alkyl sulfamoyl, N-phenylsulfamoyl, or imido, R_6 represents cycloalkyl, alkenyl, naphthyl, thienyl, benzothienyl, furyl, or pyranyl, or a group of the formula (II):



wherein R_7, R_9 and R_{11} are each hydrogen or alkyl, the sum of the carbon atoms in R_7, R_9 and R_{11} being 5 to 20, R_8 and R_{10} are hydrogen, and Y represents non-metal atoms required for forming 2,5-dioxo-imidazolidine, 2-3,5-trioxo-imidazolidine, 2,5-dioxo-triazolidine, 2,4-oxazolidinedione, 2,4-thiazolidinedione, 2(1H)-pyridone, 2(1H)-pyrazone, 5(1H)-imidazolone, 5(1H)-triazolone, 2(1H)-pyrimidone, 2-pyrazolone (5), 2-isothiazolone(5), 2(1H)-quinaoxazolone, 4(3H)-pyrimidone, 2-benzoxazolone, 4-isooxazolone(5), 3-fluorone(2), 4-imidazolone(2), 3-pyrazolone, 2-tetrazolone(5), 3-tetrazolone(5), and derivatives thereof.

4,289,848

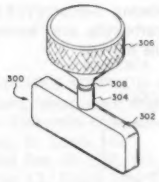
GAUGES FOR INSERTING DENTAL IMPLANTS

Alvin L. Miller, Creek Rd., Mount Holly, N.J. 08060, and Anthony J. Viscido, 7015 Keene Mill Rd., Springfield, Va. 22150

Division of Ser. No. 792,522, May 2, 1977, Pat. No. 4,177,562. This application Dec. 11, 1979, Ser. No. 102,449

Int. Cl.³ A61C *19/04*

U.S. Cl. 433—72 **1 Claim**



1. A set of independent and unconnected gauges for use with preparing a bone structure for implanting a dental implant, each of said gauges in said set including: a first portion having a substantially rectangular configuration substantially equal to the configuration of the dental implant, the first portion on at least one of said gauges having dimensions smaller than the dimensions of said implant and the first portion on at least one other of said gauges being substantially equal to the dimensions of said implant; and a second portion attached to and extending upwardly from said first portion and including a marker on said second portion and a handle means for manually holding the gauge.

4,289,849

TOOLS FOR DRILLING, REAMING AND THE LIKE WITH SIMULTANEOUS ANGULAR AND LINEAR OSCILLATORY MOTIONS

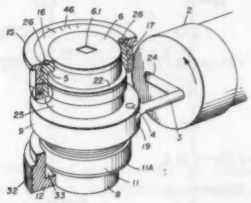
Leopold P. Lustig, 304 Greenwood St., Newton Ctr., Mass. 02159, and Anselm Yaron, Brookline, Mass., assignors to Leopold Paul Lustig, Newton, Mass.

Filed Mar. 31, 1980, Ser. No. 135,359

Int. Cl.³ A61C *00/07*

U.S. Cl. 433—123 **7 Claims**

1. A tool operating apparatus for driving a tool with two oscillatory motions at substantially the same time, one of said motions being an angular oscillatory motion back-and-forth around an established axis, the other of said motions being a linear reciprocal motion back-and-forth parallel to said axis, said apparatus comprising, in combination, a tool holder having means to receive and hold a tool, housing means supporting said tool holder on said established axis with freedom to rotate around said axis and freedom to move linearly along said axis, and drive means rotatable around a second axis extending transverse to said established axis for driving said tool holder relative to said housing means with a motion having a first component that is linear reciprocal parallel to said axis and a second component that is angular back-and-forth around said axis while said drive means is in continuous unidirectional rotation around said second axis, said apparatus including means to limit the amplitude of said linear reciprocal motion independent of said angular oscillatory motion, and means to adjust said limiting means, so as to change the amplitude of said linear reciprocal motion.



4,289,850

INTERFERON PRODUCTION

Jeffery H. Robinson, Epsom, England, assignor to Beecham Group Limited, England

Filed Jan. 10, 1980, Ser. No. 110,897

Claims priority, application United Kingdom, Jan. 16, 1979, 01632/79

Int. Cl.³ C12P *21/00*

U.S. Cl. 435—68 **9 Claims**

1. A method for preparing interferon, in which interferon-producing cells are contacted in vitro with an interferon-inducing medium comprising a non-toxic quantity of an interferon-inducing double-stranded polynucleotide, diethylamine ethyl dextran (DEAE-Dextran), and at least 100 m.mol l^{-1} of a water soluble sugar in a physiologically acceptable aqueous vehicle at physiological conditions of temperature and pH, and the interferon so formed is thereafter separated.

4,289,851

PROCESS FOR PRODUCING CYCLOSPORIN DERIVATIVES

Rene P. Traber; Max Kuhn, both of Basel; Hans Hofmann, Ettingen, and Eugen Härri, Therwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

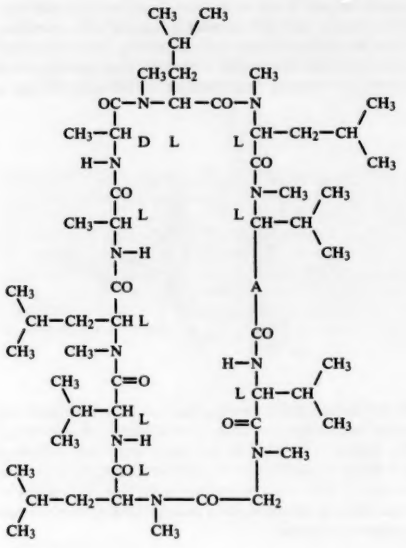
Division of Ser. No. 902,794, May 4, 1978, Pat. No. 4,220,641. This application Mar. 3, 1980, Ser. No. 126,215

Claims priority, application Switzerland, May 10, 1977, 5822/77; May 10, 1977, 5823/77; Jun. 17, 1977, 7457/77

Int. Cl.³ C12P *21/04*

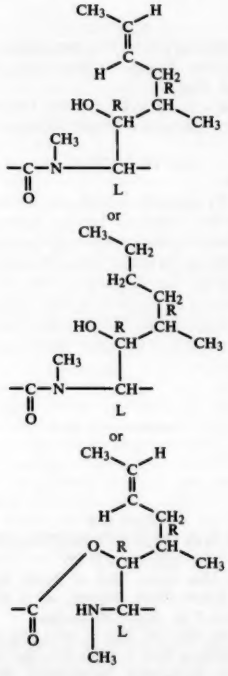
U.S. Cl. 435—71 **1 Claim**

1. A process for the production of a compound of formula I



I

wherein A is



hereinafter referred to as cyclosporin D, dihydroclosporin D or iso-cyclosporin D, respectively,
which comprises

(a) for the production of cyclosporin D, cultivating a cyclosporin D producing strain of the species *Tolypocladium inflatum Gams* in the presence of a nutrient medium and isolating cyclosporin D,

(b) for the production of dihydrocyclosporin, hydrogenating cyclosporin D, or

(c) for the production of isocyclosporin D rearranging cyclosporin D under acidic conditions.

4,289,852

PROCESS FOR PRODUCING NOVEL BICYCLODECADIENE COMPOUNDS

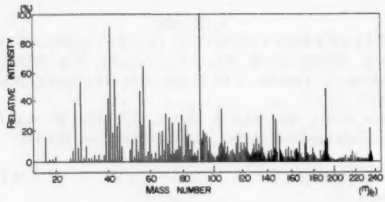
Shingo Marumo, Owariasahi, and Masato Katayama, Nagoya, both of Japan, assignors to Noda Institute for Scientific Research, Noda, Japan

Division of Ser. No. 50,226, Jun. 20, 1979, Pat. No. 4,250,120, and Ser. No. 945,831, Sep. 26, 1978, Pat. No. 4,178,462. This application Nov. 29, 1979, Ser. No. 98,894

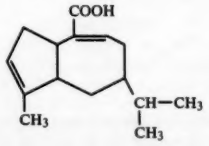
Claims priority, application Japan, Sep. 29, 1979, 52-116139

Int. Cl.³ C12P *7/24, 7/40*

U.S. Cl. 435—136 **6 Claims**

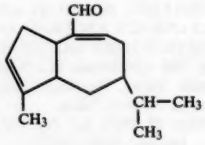


1. A process for producing 5-isopropyl-8-methylbicyclo (5.3.0) deca-2, 8-diene-2-carboxylic acid having a chemical structure represented by the formula



characterized by inoculating a microbial strain, Sclerotinia S-1 (FERM-P No. 4214, ATCC 20497) and having an ability to produce the bicyclodecadiene compound represented by the above mentioned formula into a medium containing carbon and nitrogen sources, cultivating the microbial strain there, and isolating the bicyclo-decadiene compound from the cultivated mixture.

4. A process for producing 5-isopropyl-8-methylbicyclo (5.3.0) deca-2, 8-diene-2-carboaldehyde having a chemical structure represented by the formula



characterized by inoculating a microbial strain, Sclerotinia S-1 (FERM-P No. 4214, ATCC 20497), and having an ability to produce the bicyclo-decadiene compound represented by the above-mentioned formula into a medium containing carbon and nitrogen sources, cultivating the microbial strain there, and isolating the bicyclo-decadiene compound from the cultivated mixture.

4,289,853

HIGH LOADING OF IMMOBILIZED ENZYMES ON ACTIVATED CARBON SUPPORTS

James E. Bailey, Houston, Tex., and Yong K. Cho, Rockford, Ill., assignors to Illinois Water Treatment Company, Rockford, Ill.

Division of Ser. No. 838,544, Oct. 3, 1977, Pat. No. 4,204,041.
This application May 7, 1980, Ser. No. 147,353
The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.
Int. Cl.³ C12N 11/02
U.S. Cl. 435—177 4 Claims

1. Method of immobilizing enzymes on activated carbon supports which comprises treating said activated carbon with a solution of an isoxazolium salt of the formula

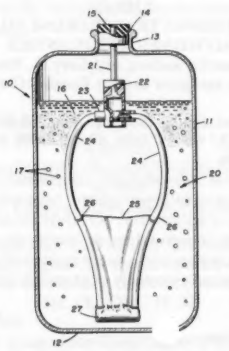
wherein R is lower alkyl and X is a bivalent lower alkylene or arylene radical, which forms a complex with reactive groups on the surface of said activated carbon, thereafter treating said activated carbon complex with a solution of an enzyme, whereby the enzyme displaces said isoxazolium salt and forms a carbon-enzyme complex, and separating said carbon-enzyme complex from the reaction media.

4,289,854

CELL CULTURE METHOD AND APPARATUS

William R. Tolbert, Manchester; Mary M. Hitt, St. Louis, and Joseph Feder, University City, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 20, 1980, Ser. No. 161,614
Int. Cl.³ C12N 5/02; C12M 3/02
U.S. Cl. 435—241 8 Claims



1. Apparatus for the suspension culturing of cells comprising
(A) a hollow flask having an opening at the top,
(B) shaft means within said flask and supported downwardly from said top opening, and
(C) a rotatable agitator means supported downwardly from said shaft means, said agitator means having supported thereon at least one flexible sheet, said flexible sheet being thus supported at upper and lower positions of the sheet to permit billowing of said sheet during rotation of the agitator means.

4,289,855

SAFETY CATALYST SYSTEMS

Donald C. Whitley, Shipley, England, assignor to Oxoid Limited, Basingstoke, England

Filed Dec. 19, 1978, Ser. No. 971,830
Claims priority, application United Kingdom, Dec. 30, 1977, 54354/77
Int. Cl.³ B01J 8/02, 35/04
U.S. Cl. 435—287 9 Claims

1. In a system comprising an anaerobic jar containing an explosive mixture of oxygen and hydrogen and a catalytic device for catalyzing a reaction between the oxygen and hydrogen, the improvement wherein said catalytic device comprises: a container having holes for the inflow and outflow of gases, a metal foil net folded or rolled up inside said container, and a pelleted catalyst held loose in and throughout the holes and folds of said metal foil net, the ratio of metal foil net to catalyst being not less than 0.75:1 by weight, whereby said metal foil net constitutes a heat-sink material which, by preventing the formation of localized hotspots, reduces the risk of an explosion between the oxygen and hydrogen.

4,289,856

PROCESS FOR PREPARING NON-YELLOWING INTEGRAL-SKINNED POLYURETHANE FOAM USING A POLYOL HAVING A FUNCTIONALITY OF 4 TO 8

Masaki Yamamoto, and Ichiro Azuma, both of Kakogawa, Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Nov. 14, 1979, Ser. No. 94,265
Claims priority, application Japan, Nov. 14, 1978, 53-140577
Int. Cl.³ C08G 18/14
U.S. Cl. 521—51 5 Claims

1. A process for preparing an integral-skinned polyurethane foam of improved heat and weathering resistance wherein a foamable composition for formation of polyurethane which comprises one or more polyols, a polyisocyanate, a cross-linking agent, a catalyst, and a blowing agent is reacted and expanded in a mold, characterized in that
(a) said one or more polyols are polyether polyols having a terminal ethylene oxide adduct rate of at least 60%, an OH number of 20 to 100 and an average functionality of 4 to 8, or one or more polyester polyols having a functionality of 4 to 8;
(b) said polyisocyanate is a non-aromatic polyisocyanate having an isocyanate index of 90 to 130;
(c) said cross-linking agent is diethanolamine and ranges from 0.5 to 20 parts by weight based on 100 parts by weight of said one or more polyols;
(d) said catalyst is an organometallic salt; and
(e) said blowing agent is a halogenated hydrocarbon of a low boiling point.

4,289,857

FOAMABLE POLYMERIC COMPOSITIONS

Tsuneo Hoki; Nobuo Miura, and Hiroshi Watanabe, all of Suzuka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Jul. 31, 1980, Ser. No. 174,297
Int. Cl.³ C08J 9/10, 9/14
U.S. Cl. 521—85 4 Claims

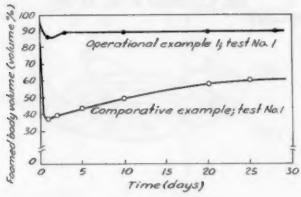
1. A foamable thermoplastic synthetic resin composition containing a polymer selected from the group consisting of styrenic and olefin polymers, a blowing agent and at least one

glycol ester compound of the formula I below in an amount of 0.1 to 10% by weight in respect to the resin:

$$[(R_1CO)_l\text{-}(OR_2)_m\text{-}O]_n\text{-}M \quad (I)$$

wherein,

R_1 is an aliphatic hydrocarbon radical with 10 to 24 carbons;



R_2 is an aliphatic polyvalent alcohol resin residue with 1 to 5 carbons;

l is a positive integer greater than 1 and less than the (alcohol valence of the R_2 group) -1;

m is a positive integer greater than 1 satisfying the following equation:

$$\frac{\text{number of carbons in } R_1 \text{ group}}{m \times \dfrac{\text{number of carbons in } R_2 \text{ group}}{\text{alcohol valence of } R_2 \text{ group}}} \geqq 0.8;$$

n is a positive integer of from 1 to 3; and

M is a residue of boric acid or phosphoric acid.

4,289,858

POLYOL-FLUOROCARBON-AMINETRIOL BLEND AND POLYISOCYANURATE FOAMS THEREFORE

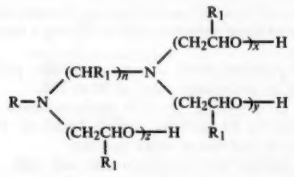
Charles E. Koehler, Baytown; Thomas R. McClellan, Seabrook, and Pat L. Murray, Houston, all of Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 47,036, Jun. 11, 1979, abandoned. This application Feb. 1, 1980, Ser. No. 117,436

Int. Cl.[3] **C08G** *18/14, 18/32, 18/42;* **C09K** *3/00*

U.S. Cl. 521—131 **17 Claims**

1. A blend comprising at least about 20 percent by weight of a fluorocarbon blowing agent and the balance being a polyol blend comprising (i) from about 20 percent to about 85 percent by weight of said polyol blend of an amine triol, or mixture of amine triols having the formula



wherein R is an aliphatic radical having from 8 to 18 carbon atoms, inclusive, each R_1 is independently selected from the group consisting of hydrogen and methyl, x, y, and z each independently have an average value between about 1 and about 5 inclusive, n is 2 or 3, and (ii) from about 15 percent to about 80 percent by weight of a primary hydroxyl polyol characterized by a molecular weight of from about 60 to about 1000 wherein said blowing agent and said polyol blend are miscible in each other.

11. In a process for the preparation of a cellular polymer in which the major recurring polymer unit is an isocyanurate moiety said process comprising the trimerization of an organic polyisocyanate in the presence of a minor amount of a polyol, a blowing agent, and a trimerization catalyst, the improvement which comprises preparing said cellular polymer by bringing together:

A. an organic polyisocyanate; and

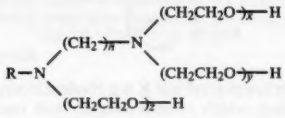
B. from about 10 to about 120 parts by weight per equivalent of said polyisocyanate of a miscible blend comprising:

(a) about 2 to about 20 percent by weight of a polyisocyanate trimerization catalyst, and

(b) about 80 to about 98 percent by weight of a mixture comprising:

1. at least about 20 percent by weight of a fluorocarbon blowing agent, and

2. the balance being a polyol blend comprising (i) from about 20 percent to about 85 percent by weight of said polyol blend of an amine triol or mixture of amine triols having the formula



wherein R is an aliphatic radical having from 8 to 18 carbon atoms, inclusive, x, y, and z each independently have an average value between about 1 and about 5 inclusive, n is 2 or 3 and (ii) from about 15 percent to about 80 percent by weight of a primary hydroxyl polyol having a molecular weight of from about 60 to about 1000; and provided the total hydroxyl equivalents present in said blend (B) are within a range of from about 0.05 to about 0.5 equivalent per equivalent of said polyisocyanate.

4,289,859

NON-BLEEDING TRANSPARENT SILICONE ADDITIVES FOR PLASTICS

Robert E. Kalinowski, Auburn, and Gary A. Vincent, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 2, 1980, Ser. No. 155,861

Int. Cl.[3] **C08L** *27/06, 69/00;* **C08K** *5/54*

U.S. Cl. 525—104 **3 Claims**

1. A transparent thermoplastic composition comprising in admixture a transparent thermoplastic resin selected from the group consisting of polystyrene, polyvinyl chloride, polyethylene terephthalate, polybutylene terephthalate, acrylic polymers, and polycarbonate and a minor amount of a fluid siloxane copolymer composed essentially of phenylsiloxane units of the general formula

$$(RO)_xC_6H_5SiO_{(3-x)/2}$$

and dimethylsiloxane units of the general formula

$$(RO)_y(CH_3)_2SiO_{(2-y)/2}$$

wherein R represents an alkyl radical having 1 to 6 carbon atoms, x is 2, 1 or 0 and y is 1 or 0, the siloxane copolymer having a ratio of phenylsiloxane units to dimethylsiloxane units in the range of 0.6 to 2, a phenyl radical content above 22 weight percent based on the total weight of the copolymer, and a ratio of alkoxy groups to silicon atoms above 0.3.

4,289,860

GRAFTING OF SILANE ON THERMOPLASTICS OR ELASTOMERS FOR PURPOSES OF CROSS LINKING

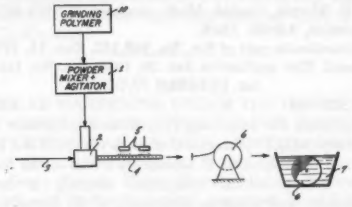
Fritz Glander, Isernhagen, and Hermann U. Voigt, Langenhagen, both of Fed. Rep. of Germany, assignors to Kabel- und Metallwerke Gutehoffnungshütte AG, Hanover, Fed. Rep. of Germany

Filed Mar. 10, 1975, Ser. No. 557,108

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1974, 2411141; Aug. 17, 1974, 2439513; Aug. 17, 1974, 2439534

Int. Cl.[3] C08F 255/02

U.S. Cl. 525—263 35 Claims



1. In a method for cross-linking thermoplastic or elastomeric material wherein cross-linking is preceded by grafting of silane and is carried out in the presence of moistures, the combination of steps comprising:

providing the thermoplastic or elastomeric material as dry, fluid powder;

agitating the powder to obtain fluidization thereof and raising the temperature by operation of the agitating;

adding a silane compound to the material prior to completion of the agitation, the silane compound being of the variety that permits grafting on the molecules of said powder;

providing for a temperature below the crystallite melting range, between 80° C. and 100° C., so that the silane or silane compound as agitated together with the said material fluid is caused to diffuse into the fluid particles without grafting; and

providing for grafting of the silane or silane compound molecules to the molecules of the thermoplastic or elastomeric material.

4,289,861

CURABLE RUBBER COMPOSITIONS WITH AMINO ACIDS

Masao Onizawa, Ohmiya, Japan, assignor to Sanyo Trading Co., Ltd., Japan

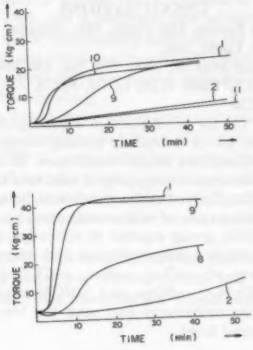
Filed Dec. 9, 1976, Ser. No. 749,081

Claims priority, application Japan, Dec. 27, 1975, 50-155874; Apr. 23, 1976, 51-45438; May 12, 1976, 51-53338

Int. Cl.[3] C08C 19/22

U.S. Cl. 525—346 4 Claims

1. A curable composition consisting of (A) at least one rubber selected from the group consisting of a styrene-butadiene rubber, an acrylonitrile-butadiene rubber, a polybutadiene rubber, an acrylonitrile-isoprene rubber, an alfin rubber, a butadiene-methyl methacrylate rubber, a polyisoprene rubber, an acrylonitrile-butadieneisoprene rubber, a carboxylated acrylonitrile-butadiene rubber, a propylene oxide rubber, a propylene-butadiene rubber, and natural rubber, (B) at least one curing agent selected from the group consisting of sulfur and sulfur donors, and (C) at least one compound, as a vulcanization accelerator not requiring an activator, selected from the group consisting of arginine, lysine, hydroxylysine, ornithine, proline, hydroxyproline, leucine, isoleucine, histidine, tryptophan, threonine, serine, homoserine, alanine, phenylalanine,



valine, methionine, citrulline, tyrosine, asparagine, aspartic acid, glutamine, glutamic acid, and salts of these amino acids.

4,289,862

LIQUID PHOSPHAZENE COMPOSITIONS

Edwin D. Hornbaker, and Hsueh M. Li, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Jul. 14, 1980, Ser. No. 167,748

Int. Cl.[3] C08L 79/00

U.S. Cl. 525—538 15 Claims

1. In combination,

(i) a normally solid or viscous linear, substituted, crosslinkable phosphazene polymer having a viscosity of greater than 500,000 cps at 23° C., said polymer containing crosslinkable unsaturation in some of the substituents attached to the phosphorus atoms of said polymer, in admixture with

(ii) from about 1 to about 30 parts per 100 parts of polymer of a curing agent selected from the group consisting of a polythiol, a polyacrylate, a polymethacrylate and mixtures thereof such that the combination has a viscosity of less than 500,000 cps at 23° C.

4,289,863

ETHYLENE POLYMERIZATION PROCESS

Robert W. Hill, Houston, Tex.; William L. Kehl, Pittsburgh, Pa., and Thomas J. Lynch, Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 86,890, Oct. 10, 1979, which is a division of Ser. No. 864,296, Dec. 27, 1977, Pat. No. 4,219,444, which is a continuation-in-part of Ser. No. 722,197, Sep. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 612,252, Sep. 10, 1975, abandoned. This application Apr. 4, 1980, Ser. No. 137,341

Int. Cl.[3] C08F 4/02, 4/24

U.S. Cl. 526—106 6 Claims

1. In a Particle Form Process for the polymerization of ethylene, the improvement which comprises employing as the polymerization catalyst a catalyst prepared by depositing a chromium compound upon an amorphous inorganic carrier containing aluminum and phosphorus moieties; said carrier having been prepared by neutralizing an acidic aqueous solution containing Al^{+++} cations and PO_4^{---} anions in an aqueous medium at a pH in the range of about 4.0–11.0 to form a solid precipitate containing aluminum and phosphorus moieties, and recovering said precipitate; said acidic solution containing aluminum and phosphorus in an atomic ratio in the range of about 5:1 to 1:1.

4,289,864

OXIDATIVE POLYMERIZATION OF MONOMERS HAVING AT LEAST TWO ACTIVATED UNSATURATIONS

Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 19, 1980, Ser. No. 150,789

Int. Cl.³ C08F *4/28, 16/00, 18/18, 22/28*

U.S. Cl. 526—235 **10 Claims**

1. A process for the production of a hydrophilic air-curing polymer system which comprises passing oxygen through a monomer maintained at a temperature below 30° C., said monomer having a structure comprising at least two unsaturations, with no more than three of said unsaturations being adjacent in the molecule, at least one of said unsaturations being α, β or β, γ to a nucleophilic group capable of activating the unsaturation towards oxidative polymerization and selected from the group consisting of —O—, —S—, —CON<, —COO—, >C=C<, —SO_2N<, —SO_2— and >NCN, so as to polymerize the monomer oxidatively and raise the viscosity of the system to a desired level.

4,289,865

POLYMERS ACRYLOYLOXYARYLENESULFONAMIDES

John C. Wilson, and Paul D. Yacobucci, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

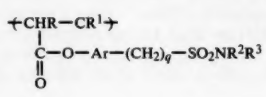
Filed Mar. 21, 1979, Ser. No. 22,406

Int. Cl.³ C08F *20/38*

U.S. Cl. 526—288 **6 Claims**

1. A polymer having an inherent viscosity within the range of from about 0.10 to about 2.0 comprising:

(a) about 1 to 100 mole percent of one or more units having the formula:



wherein:

R and R^1 are independently hydrogen, halide or alkyl;

R^2 and R^3 are independently hydrogen, alkyl, cycloalkyl, aryl or aralkyl;

q is 0 or 1; and

Ar is arylene having from 6 to 18 carbon atoms, wherein no more than one of R^2 and R^3 is hydrogen; and

(b) 0 to 99 mole percent of one or more additional polymerized ethylenically unsaturated polymerizable monomers.

4,289,866

PROCESS FOR THE PREPARATION OF COPOLYMERS

Jürgen Ritz, Mainz; Hermann Hotze, and Hans-Dieter Mummenthey, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,378

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907997

Int. Cl.³ C08F *222/20;* **C08G** *83/00*

U.S. Cl. 526—320 **10 Claims**

1. In a process for the manufacture of copolymers reacting in a first step an olefinically unsaturated dicarboxylic acid with a polyhydric alcohol to yield a hemi-ester having free hydroxyl groups, reacting said hemi-ester in a second step with a monoepoxy compound to yield an olefinically unsaturated diester containing hydroxyl groups and copolymerizing said diester with at least one unsaturated monomer having no free carboxyl groups, the improvement which comprises reacting the hemi-ester having no ether groups in a second step with an equivalent amount of a monoepoxide compound, based on the hydroxyl groups of the hemi-ester, selected from the group consisting of glycidol, a glycidylether of a phenol and glycidylester of saturated carboxylic acids at a temperature between 100° and 170° C. to yield a reaction product having a molecular weight between 250 and 1500 and an OH-number between 175 and 550 and then copolymerizing the diester having 2 hydroxyalkyl radicals at a temperature between 80° and 220° C. and wherein the hardenable reaction product thus obtained is either isolated or hardened with a hardening agent.

4,289,867

ORGANOFUNCTIONAL POLYSILOXANE POLYMERS AND A METHOD FOR PREPARING THE SAME

Eugene R. Martin, Onsted, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 968,152, Dec. 11, 1978, abandoned. This application Jan. 30, 1980, Ser. No. 116,723

Int. Cl.³ C08G *77/06*

U.S. Cl. 528—12 **8 Claims**

1. A process for preparing polysiloxane polymers which contain only $(M)_x(T')_y$ structural units in which M is a unit of the formula $R_3SiO_{0.5}$ and T' represents a unit of the formula $(R''S)_zR'$ $SiO_{1.5}$ which comprises reacting a hexaorganodisiloxane with a silicon compound of the formula

$$[(R''S)_Z\ R'Si\ OR_3](R''S)_z\ R'Si(OR)_3$$

in the presence of an acid catalyst having a pKa value less than 1.0, in which R is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, R' is selected from the group consisting of divalent, trivalent and tetravalent hydrocarbon radicals having from 2 to 18 carbon atoms and divalent, trivalent and tetravalent hydrocarbon radicals having at least one —C—S—C— group, R'' is selected from the group consisting of hydrogen, and R, x and y are each greater than 1 and up to 20,000, where the ratio of x to y may vary from 1:0.33 to 0.005:1 and z is 1, 2 or 3.

8. The product prepared in accordance with the process of claim 1.

4,289,868

POLYHYDANTOINS FROM UNSATURATED CARBOXYLIC ACIDS AND POLYISO(THIO)CYANATES

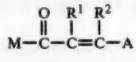
Jürgen Lewalter, Odenthal; Rudolf Merten, Leverkusen; Wilfried Zecher, Leverkusen, and Willi Dünwald, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 958,940, Nov. 8, 1978, abandoned. This application Dec. 6, 1979, Ser. No. 100,712

Int. Cl.³ C08G *18/34, 18/38, 18/67;* **C07D** *233/80*

U.S. Cl. 528—73 **3 Claims**

1. A process for the preparation of polyhydantoins and polythiohydantoins, comprising reacting organic polyisocyanates or polyisothiocyanates at temperatures of from −20° to +500° C. with compounds consisting essentially of unsaturated carboxylic acid derivatives of the formula:



wherein R^1 and R^2 are the same or different and each represents hydrogen, halogen, a C_1–C_{20} aliphatic group, a C_7–C_{20} aliphatic-aromatic group, a C_6–C_{20} aromatic group or a heterocyclic group having from 4 to 16 ring members and at least one N, O or S atom;

A represents CN, COR, substituted or unsubstituted C_1–C_{20} aliphatic group, C_7–C_{20} aliphatic-aromatic group, C_6–C_{20} aromatic group or a heterocyclic group having from 4 to 16 ring members and at least one N, O or S atom wherein the substituents are NO_2, $COOR_4$, CN, CO or OH; R and

R^4 are selected from the definition of R^1 and R^2 with the exclusion of halogen;
M represents OH or

$$\begin{array}{l} \\ | \\ R^6\text{—}NH; \end{array}$$

and
R^6 represents hydrogen, unsubstituted or substituted C_2–C_{20} aliphatic, C_5–C_{12} cycloaliphatic, C_6–C_{20} aliphatic aromatic, or a C_5–C_{12} aromatic or C_5–C_{12} cycloaliphatic containing a heteroatom N, O or S in the ring, wherein the substituents are at least one halogen, C_1–C_{10} alkyl or C_6–C_{12} aryl.

4,289,869

MIXTURE HARDENING UNDER THE INFLUENCE OF AIR MOISTURE AND A PROCESS FOR PRODUCTION OF POLYISOCYANATE-POLY-ADDITION PRODUCTS OR OF CROSS-LINKED POLYEPOXIDES

Hans-Georg Zengel, Kleinwallstadt; Michael Wallrabenstein, Wörth, and Walter Brodowski, Amorbach, all of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed May 22, 1980, Ser. No. 152,368

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922176

Int. Cl.[3] **C08G** *18/32, 59/18, 59/50*

U.S. Cl. 528—73 **14 Claims**

1. A polymeric mixture hardenable in the presence of moisture comprising

at least one organic polyisocyanate or polyepoxide; and a hardener activated by moisture in an amount sufficient to induce a chemical cross-linking reaction comprising an N,N′-substituted imidazolidine derivative or an N,N′-substituted hexahydropyrimidine derivative, which do not have a —CO—NH— group at any nitrogen atom.

14. Method for preparing polyisocyanate polyaddition products or cross-linked polyepoxides in the presence of water comprising reacting organic polyisocyanates or polyepoxides with N,N′-substituted imidazolidine derivatives or with N,N′-substituted hexahydropyrimidine derivatives having at no nitrogen atom a —CO—NH— grouping, under the hydrolyzing influence of water.

4,289,870

2,2′,6,6′-TETRAMETHYLBIPHENYL-4,4′-DIOL POLYESTERS

John A. Donohue, Elmhurst, and Edward E. Paschke, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 3, 1979, Ser. No. 81,341

Int. Cl.[3] **C08G** *63/16, 63/18, 63/20, 63/40*

U.S. Cl. 528—193 **13 Claims**

1. A polyester comprising units of a dicarboxylic acid component and dihydroxy component wherein said dicarboxylic acid component comprises non-vicinal benzene dicarboxylate moieties and said dihydroxy component comprises 2,2′,6,6′-tetramethylbiphenyl-4,4′-diol moieties.

4,289,871

METHOD TO INCREASE REACTOR CAPACITY FOR POLYCONDENSATION OF POLYESTERS

Hugh H. Rowan, Chapel Hill, N.C.; Max B. Mueller, Royal Oak, Md., and Stanley D. Lazarus, Petersburg, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Mar. 27, 1980, Ser. No. 134,592

Int. Cl.[3] **C08G** *63/18*

U.S. Cl. 528—309 **17 Claims**

1. A method to increase the reactor capacity and throughput and/or increase final viscosity of the polyester for polycondensation of molten ethylene terephthalate polyesters in a high surface area-to-volume ratio reactor operating at temperatures between about 275° C. and 300° C., pressures between about 0.1 and 760 Torr, and a residence time of between about 0.1 and 6 hours while continuously removing the vaporous products of condensation in a vapor removal system, and increasing the viscosity of the polyester having an initial intrinsic viscosity above 0.4, comprising:

a. injecting liquid inert vaporizable and condensible material having an atmospheric boiling point between about 220° C. and 250° C., and a solubility parameter between about 10 and 16 into the molten polyester at said reaction temperature so that it vaporizes to form vapor bubbles to further increase the surface area-to-volume ratio in the reactor, and

b. passing said inert material through said molten polyester and into said vapor removal system, and

c. condensing said inert material in said vapor removal system.

4,289,872

MACROMOLECULAR HIGHLY BRANCHED HOMOGENEOUS COMPOUND BASED ON LYSINE UNITS

Robert G. Denkewalter, Westfield; Jaroslav Kolc, Randolph Twp., Morris County, and William J. Lukasavage, Harrison, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 6, 1979, Ser. No. 27,622

Int. Cl.[3] **C08G** *69/10*

U.S. Cl. 528—328 **5 Claims**

1. A macromolecular compound composed of at least four successive layers of lysine units:

the first said layer consisting of one lysine unit linked as an amide, via its carbonyl group, to an amino group of a compound (S) in which amino groups are the only groups reactive with the lysine molecule;

the second layer consisting of two lysine units each linked as an amide, via the respective carbonyl groups, to one of the two amino groups in the lysine unit of the first layer;

the third layer consisting of four lysine units each linked as an amide, via the respective carbonyl groups, to one of the four amino groups in the two lysine units of the second layer;

the fourth layer consisting of eight lysine units each linked as an amide, via the respective carbonyl groups, to one of the eight amino groups in the four lysine units of the third layer.

4,289,873

PROCESS FOR PRODUCING LACTONE POLYESTERS

Masayoshi Kubo, Oi; Michio Nakanishi, Niza, and Mamoru Kimura, Oi, all of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Nov. 28, 1979, Ser. No. 97,780

Claims priority, application Japan, Nov. 30, 1978, 53-148211

Int. Cl.[3] **C08G** *63/10*

U.S. Cl. 528—357 **14 Claims**

1. In a process for producing a lactone polyester which comprises ring-opening polymerization of a lactone in the presence of a metal containing organic compound as a catalyst, the improvement wherein said catalyst is an alcoholate, chelate or organic carboxylic acid salt of vanadium or molybdenum.

4,289,874

AQUEOUS CRYSTALLIZATION OF POLYESTER

Ronald E. Bockrath, Aurora, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 923,060, Jul. 10, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,212
Int. Cl.[3] C08G *61/00, 61/12;* C08J *3/00*
U.S. Cl. 528—487 8 Claims

1. A process of increasing crystallinity of water-insoluble crystallizable polyester pellets in an aqueous medium which comprises crystallizing polyester pellets having a diameter of 0.5 mm to 2.0 mm and 0.5 mm to 4 mm in length in an aqueous medium at about 50°–150° C. containing 0.0001 to 5% by weight of at least one surface active agent capable of preventing agglomeration of said polyester pellets selected from the group consisting of nonionic surface active agents and anionic surface active agents and dewatering said polyester pellets, wherein said polyester pellets comprise from 5–60% by weight of the aqueous bath.

4,289,875

PROCESS FOR CONTINUOUS FILTRATION AND AGING OF XANTHATED ALKALI CELLULOSE

Charles J. Geyer, Jr., Berwyn, and Ben E. White, Wayne, both of Pa., assignors to Fiber Associates, Incorporated, Wayne, Pa.

Filed Oct. 29, 1979, Ser. No. 89,129
Int. Cl.[3] 308B *9/04*
U.S. Cl. 536—60 13 Claims

1. An improved continuous process for forming cellulose products by the viscose process from a solution of xanthated alkali cellulose, wherein said solution of xanthated alkali cellulose is passed in a downstream direction through a series of filter means, the improvement comprising controlling the rate of flow per unit area whereby each said filter means in said series has a successively greater initial pressure differential as said xanthated alkali cellulose solution passes in said downstream direction through said series of filter means, so that the filter rate is inversely related to the degree of gel removal.

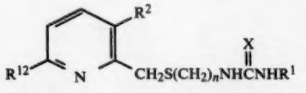
4,289,876

ANTISECRETORY AGENTS

Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 963,477, Nov. 24, 1978, Pat. No. 4,250,316. This application Mar. 10, 1980, Ser. No. 129,158
Int. Cl.[3] C07D *213/28*
U.S. Cl. 542—416 6 Claims

1. A compound of the formula



I

wherein R^1 is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, inclusive; R^2 is hydrogen, hydroxy, cyano, (lower)alkyl, (lower)alkoxy, halogen or amino; n is 2 or 3; X is NR^3 or CHR^3; R^3 is SO_2Ar or SO_2(lower)alkyl; R^{12} is hydrogen or $(CH_2)_pNR^{13}R^{14}$; p is an integer of from 1 to 4, inclusive; R^{13} and R^{14} each are independently hydrogen or (lower)alkyl; and Ar is phenyl or phenyl containing 1 or 2 substituents independently selected from halogen and (lower)alkyl; or a nontoxic, pharmaceutically acceptable salt thereof.

6. 1-Phenylsulfonyl-2-(2-propynylamino)-2-{2-[(3-bromo-2-pyridyl)methylthio]ethylamino}ethylene, or a nontoxic pharmaceutically acceptable salt thereof.

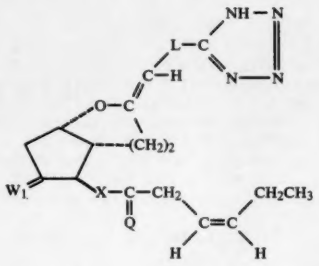
4,289,877

2-DECARBOXY-2-TETRAZOLYL-9-DEOXY-5,9α-EPOXY-4,5-CIS-17,18-TETRADEHYDRO-PGF$_1$ COMPOUNDS

Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 932,982, Aug. 11, 1978, Pat. No. 4,212,968, which is a division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Sep. 7, 1979, Ser. No. 73,462
Int. Cl.[3] C07D *405/02*
U.S. Cl. 542—431 16 Claims

1. A compound of the formula



wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene, α-H:β-H, α-CH_2OH:β-H;

wherein L is

(1) $-(CH_2)_d-C(R_2)_2$, or

(2) —CH=CH—,

wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,

wherein Q is oxo, α-H:β-H, α-OH:β-R_8 or α-R_8:β-OH

wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; and

wherein X is

(1) trans-CH=CH—,

(2) cis-CH=CH—,

(3) —C≡C—, or

(4) $-CH_2CH_2-$; including the lower alkanoates thereof.

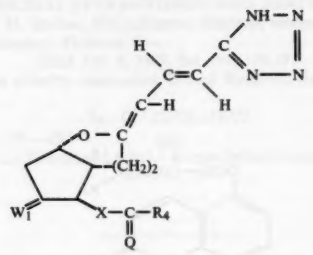
4,289,878

2-DECARBOXY-2-TETRAZOLYL-TRANS-2,3,4,5-TETRADEHYDRO-PGI$_1$ COMPOUNDS

Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

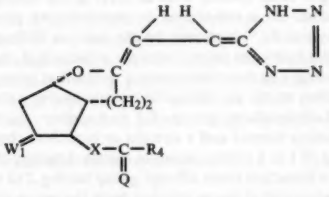
Division of Ser. No. 936,295, Aug. 23, 1978, Pat. No. 4,202,972, which is a division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Sep. 7, 1979, Ser. No. 73,464
Int. Cl.[3] C07D *405/02*
U.S. Cl. 542—431 18 Claims

1. A 4Z compound of the formula



wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene, α-H:β-H, α-CH_2OH:β-H;
wherein Q is oxo, α-H:β-H, α-OH:β-R_8 or α-R_8:β-OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; and
wherein R_4 is
(1) —CR_5R_6—C_gH_{2g}=CH_3
(2) —CR_5R_6—Z—(Ph)
(3) cis—CH_2—CH=CH—CH_2CH_3
wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the (Ph); wherein (Ph) is phenyl or phenyl substituted by (T)s, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_7—, wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—;
including the lower alkanoates thereof.

16. A 4E compound of the formula



wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene, α-H:β-H, α-CH_2OH:β-H;
wherein Q is oxo, α-H:β-H, α-OH:β-R_8 or α-R_8:β-OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; and
wherein R_4 is
(1) —CR_5R_6—C_gH_{2g}=CH_3
(2) —CR_5R_6—Z—(Ph)
(3) cis—CH_2—CH=CH—CH_2CH_3
wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the (Ph); wherein (Ph) is phenyl or phenyl substituted by (T)s, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_7—, wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and
wherein X is
(1) trans-CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—;
including the lower alkanoates thereof.

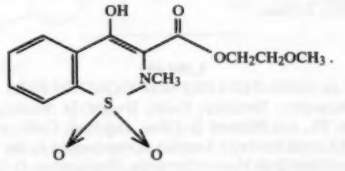
4,289,879

SYNTHETIC METHOD AND INTERMEDIATE FOR PIROXICAM

Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 191,716
Int. Cl.[3] **C07D** *279/02*
U.S. Cl. 544—49 **4 Claims**

1. A compound of the formula



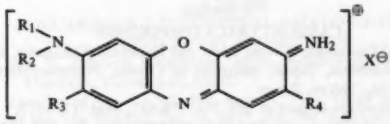
4,289,880

CATIONIC OXAZINE DYES

Peter Moser, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 11, 1979, Ser. No. 56,664
Claims priority, application Switzerland, Jul. 21, 1978, 7907/78
Int. Cl.[3] **C07D** *265/38*
U.S. Cl. 544—103 **3 Claims**

1. A cationic oxazine dye of the formula I



(I)

in which R_1, R_2, R_3 and R_4 independently of one another are each C_{1-4}-alkyl, with R_1 and R_2 together with the nitrogen atom also being able to form a heterocyclic ring, and $X\ominus$ is an anion.

3. A cationic oxazine dye according to claim **1**, wherein R_1, R_2, R_3 and R_4 are each methyl.

4,289,881
PROCESS FOR THE PREPARATION OF 1,4-DIAZABICYCLO-(2,2,2)-OCTANE

Laszlo Imre, Leverkusen; Walter Horstmann, Bergisch Gladbach, and Hans-Gerhard Leopold, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

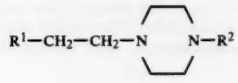
Filed Oct. 15, 1979, Ser. No. 84,928

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846813

Int. Cl.[3] **C07D** *295/02*

U.S. Cl. 544—352 **10 Claims**

1. A process for the preparation of 1,4-diazabicyclo-(2,2,2)-octane which comprises contacting a piperazine compound of the formula



wherein

R^1 denotes the hydroxyl group or the amino group and

R^2 represents hydrogen or the radical

$$-A-R^3$$

wherein

A denotes a straight-chain or branched hydrocarbon radical and

R^3 denotes the hydroxyl group or the amino group, at a temperature in the range from 200° to 500° C. with a catalyst containing at least 97 percent by weight free silicon dioxide.

4,289,882
4a-ARYL-DECAHYDROISOQUINOLINES

Henry Rapoport, Berkeley, Calif.; Dwight D. Weller, Champaigne, Ill., and Richard D. Gless, Oakland, Calif., assignors to The United States of America as represented by the Department of Health & Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 900,275, Apr. 26, 1978, Pat. No. 4,189,583. This application Sep. 5, 1978, Ser. No. 939,706

Int. Cl.[3] **C07D** *217/24, 217/16*

U.S. Cl. 546—141 **5 Claims**

1. A compound, tert-butyl 1,6-dioxo-4a-(3'-methoxyphenyl)-2-methyl-decahydroisoquinoline-7-carboxylate (33).

2. A compound, 1,6-dioxo-4a-(3'-methoxyphenyl)-2-methyl-decahydroisoquinoline (9).

3. A compound, trans-Δ^7-6α-hydroxy-4aα-(3'-hydroxyphenyl)-2-methyloctahydroisoquinoline (6).

4. A compound, trans-Δ^7-6α-hydroxy-4a-(3'-methoxyphenyl-2-methyloctahydroisoquinoline (7).

5. A compound, $\Delta^6\Delta^{8(8a)}$-6-methoxy-4a-(3'-methoxyphenyl)-2-methylhexahydroisoquinoline (8).

4,289,883
CARBOSTYRIL COMPOUNDS

Michiaki Tominaga; Hitoshi Tone, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 778,537, Mar. 17, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 965,535

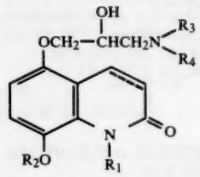
Claims priority, application Japan, Mar. 17, 1976, 51-28957; May 7, 1976, 51-52498

The portion of the term of this patent subsequent to Jul. 1, 1997, has been disclaimed.

Int. Cl.[3] **C07D** *215/22;* **A61K** *31/47*

U.S. Cl. 546—158 **18 Claims**

1. A carbostyril compound represented by the formula (I):



(I)

wherein R_1 represents a hydrogen atom, a straight or branched chain alkyl group having 1 to 6 carbon atoms or a phenylalkyl group selected from the group consisting of monophenylalkyl and diphenylalkyl groups having a straight or branched chain alkyl group having 1 to 6 carbon atoms in the alkyl moiety thereof, R_2 represents a straight or branched chain alkenyl group having 2 to 6 carbon atoms, an alkoxyalkyl group having a straight or branched chain alkoxy group of 1 to 6 carbon atoms in the alkoxy moiety thereof and a straight or branched chain alkylene group of 1 to 6 carbon atoms in the alkyl moiety thereof, a mono hydroxyalkyl group having a straight or branched chain alkyl group of 1 to 6 carbon atoms, a carboxyalkyl group having a straight or branched chain alkylene group of 1 to 6 carbon atoms in the alkyl moiety thereof, an alkylcarbonyl group having a straight or branched chain alkyl group of 1 to 6 carbon atoms in the alkyl moiety thereof, a cycloalkylcarbonyl group having a cycloalkyl group of 3 to 7 carbon atoms in the cycloalkyl moiety thereof, an alkylcarbonylalkyl group having a straight or branched chain alkylene group of 1 to 6 carbon atoms and the alkyl carbonyl group as defined hereinabove for R_2, an alkoxycarbonylalkyl group having an alkoxycarbonyl moiety consisting of a straight or branched chain alkoxy group having 1 to 6 carbon atoms attached to a carbonyl group and a straight or branched chain alkyl group having 1 to 6 carbon atoms in the alkyl moiety thereof, a straight or branched chain alkynyl group having 2 to 7 carbon atoms or a carbamoylalkyl group having a straight or branched chain alkylene group of 1 to 6 carbon atoms in the alkyl moiety thereof and a carbamoyl group which may be substituted on the nitrogen atom thereof with an alkyl group having 1 to 6 carbon atoms or a substituted or unsubstituted phenylalkyl group, R_3 and R_4, which may be the same or different, each represents a hydrogen atom, a straight or branched chain alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 3 to 7 carbon atoms, an alkoxyalkyl group having a straight or branched chain alkoxy group of 1 to 6 carbon atoms in the alkoxy moiety thereof and a straight or branched chain alkylene group of 1 to 6 carbon atoms in the alkyl moiety thereof, a straight or branched chain alkenyl group having 2 to 6 carbon atoms, a phenylalkyl group selected from the group consisting of monophenylalkyl and diphenylalkyl groups having a straight or branched chain alkyl group having 1 to 6 carbon atoms in the alkyl moiety thereof, a phenoxyalkyl group having a straight or branched alkylene group of 1 to 6 carbon atoms in the alkyl moiety thereof, or a phenyl group, the 3,4-bond of the carbostyril nucleus represents a single or double bond, said phenyl, phenylalkyl or phenoxyalkyl being unsubstituted or having 1 to 3 substituents being selected from the group consisting of alkyl groups having 1 to 4 carbon atoms, alkoxy groups having 1 to 4 carbon atoms, halogen atoms, alkylenedioxy groups having 1 to 2 carbon atoms, carbamoyl and substituted or unsubstituted phenyl, and the pharmaceutically acceptable acid addition salts thereof.

4,289,884

HERBICIDAL TETRAHYDROFURAN DERIVATIVES

Michael D. Barker, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 3, 1980, Ser. No. 109,382

Claims priority, application United Kingdom, Jan. 8, 1979, 613/79

Int. Cl.[3] C07D *239/72*

U.S. Cl. 546—283 1 Claim

1. 2,2-Dimethyl-5-ethyl-5-(2-pyridylmethoxymethyl)oxolane.

4,289,885

3-[2-(DIMETHYLAMINO)-2-PHENYLETHYL]N-[PHENYLAMINO)CARBONYL]SYDNONE IMINE, A NEW CENTRAL NERVOUS SYSTEM STIMULANT

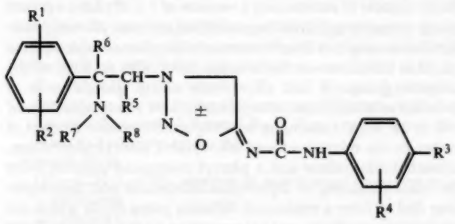
Reinhardt P. Stein, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Oct. 2, 1980, Ser. No. 193,043

Int. Cl.[3] C07D *271/04, 413/06*

U.S. Cl. 548—125 8 Claims

1. A compound of the formula:



in which

R^1 and R^2 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, perfluoroalkyl of 1 to 3 carbon atoms, nitro, alkanoyl of 2 to 4 carbon atoms or alkoxycarbonyl of 2 to 4 carbon atoms;

R^3 is hydrogen, halo, nitro or alkanoyl of 2 to 4 carbon atoms;

R^4 is hydrogen, halo, nitro or perfluoroalkyl of 1 to 3 carbon atoms;

R^5 and R^6 are, independently, hydrogen or methyl; and

R^7 and R^8 are, independently, alkyl of 1 to 4 carbon atoms, or when taken with the nitrogen atom to which they are attached form a piperidinyl, pyrolidinyl, morpholinyl, N-alkyl piperazinyl in which the alkyl group contains from 1 to 6 carbon atoms or N-phenylpiperazinyl group; or

a non-toxic acid addition salt thereof.

4,289,886

IMIDES DERIVED FROM 2-THIOXO-3-BENZOX(THIA)AZOLINE ACETIC, AND PROPIONIC ACIDS

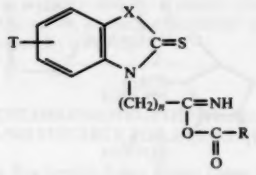
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 5, 1979, Ser. No. 55,102

Int. Cl.[3] C07D *261/58;* A01N *43/72;* C07D *277/70;* A01N *43/78*

U.S. Cl. 548—165 5 Claims

1. A compound having the formula



wherein X is sulfur or oxygen, R is lower alkyl, T is selected from the group consisting of hydrogen, halogen, nitro, lower alkyl and trifluoromethyl and n is 1 or 2.

4,289,887

BENZOFURANE BENZOXAZOLES

Bernhard Wehling, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

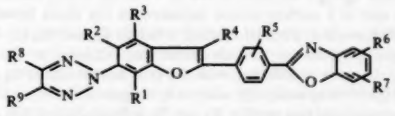
Filed Apr. 21, 1980, Ser. No. 141,831

Claims priority, application Fed. Rep. of Germany, May 11, 1979, 2918965

Int. Cl.[3] C07D *263/58;* C09K *11/06*

U.S. Cl. 548—224 2 Claims

1. A benzofurane compound of the formula



in which

R^1, R^2 and R^3 denote hydrogen, alkyl, alkoxy or halogen,

R^4 denotes hydrogen, aryl or alkyl,

R^5 denotes hydrogen, halogen, or alkyl,

R^6 denotes hydrogen, halogen, alkyl, alkoxy, alkylsulphonyl, phenylsulphonyl, CN, CF_3, COOR, SO_3R, CONRR′ or SO_2NRR',

R^7 denotes hydrogen, halogen, alkyl or alkoxy,

R denotes alkyl and

R′ denotes alkyl or H,

R^8 denotes aryl, alkyl, aralkyl, styryl or alkoxy, and

R^9 denotes hydrogen, CN, COOR, CONRR′ or R^8, or R^8 and R^9 together denote a fused-on hydroaromatic or aromatic ring, and

the abovementioned hydrocarbon radicals and alkoxy radicals and the optionally fused-on ring systems optionally being substituted by substituents customary in brightener chemistry.

4,289,888

2-DECARBOXY-2-TETRAZOLYL-4-HALO-5,9-EPOXY-9-DEOXY-PGF$_{1\alpha}$ COMPOUNDS

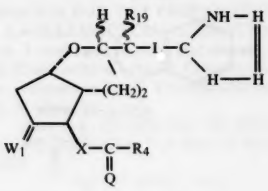
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 932,981, Aug. 11, 1978, which is a division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Sep. 7, 1979, Ser. No. 73,456

Int. Cl.[3] C07D *405/02*

U.S. Cl. 548—253 9 Claims

1. A compound of the formula



wherein W_1 is α-OH:β-H, α-H:β-OH, oxo, methylene, α-H:β-H, α-CH_2OH:β-H;
wherein L is
(1) $-(CH_2)_d-C(R_2)_2-$,
(2) $-O-CH_2-Y$, or
(3) $-CH=CH-$,
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,
wherein Q is oxo, α-H:β-H, α-OH:β-R_8 or α-R_8:β-OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_4 is
(1) $-CR_5R_6-C_gH_{2g}=CH_3$
(2) $-CR_5R_6-Z-(Ph)$
(3) cis$-CH_2-CH=CH-CH_2CH_3$
wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the (Ph); wherein (Ph) is phenyl or phenyl substituted by (T)s, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7-$, wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different;
wherein R_{19} is chloro, bromo, or iodo; and wherein X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) $-CH_2CH_2-$.

4,289,889

PREPARATION OF TETRAALKOXYSILANES

William B. Herdle, Greenburgh; Bernard Kanner, Nyack, both of N.Y., and Donald L. Bailey, Traverse City, Mich., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 163,976
Int. Cl.³ C07F *7/04, 7/18*
U.S. Cl. 556—470 **5 Claims**

1. A process for the preparation of a tetraalkylorthosilicate with comprises (I) contacting at a temperature in the range of 200° C. through 350° C. for a period of time sufficient to form a silane mixture (A) an alkanol ROH wherein R is an alkyl group of from one to three carbon atoms and (B) dimethylamine with (C) copper-activated silicon, wherein the mole ration of dimethylamine (B) to alkanol (A) is in the range of from 0.2:1 to 10:1, and (II) subsequently adding to said silane mixture at least enough alkanol ROH to convert all of the silanes present to tetraalkylorthosilicates.

4,289,890

SYNTHESIS OF CHLOROMETHYLDISILANES

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 11,079, Feb. 12, 1979. This application Nov. 7, 1979, Ser. No. 92,205
Int. Cl.³ C07F *7/08, 7/16, 7/14, 7/12*
U.S. Cl. 556—430 **22 Claims**

1. A process for synthesizing chloromethyldisilanes starting from the disilane fraction resulting from the direct process for the manufacture of silicones, said process comprising the steps of
(a) reacting said disilane fraction with a methylating agent to form hexamethyldisilane and
(b) reacting said hexamethyldisilane with a further portion of said disilane fraction to form a chloromethyldisilane product.

4,289,891

SILICONE DIFFUSION PUMP FLUIDS

Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 21, 1978, Ser. No. 898,747
Int. Cl.³ C07F *7/08*
U.S. Cl. 556—453 **12 Claims**

1. A process for forming inexpensive silicone diffusion pump fluids capable of maintaining a vacuum of 1×10^{-6} in a vacuum pump comprising (1) reacting sufficient amounts of an aliphatic alcohol having 1 to 3 carbon atoms with phenyltrichlorosilane so as to substitute on the average from 30% to 80% of the chlorine groups in said silane with alkoxy groups so as to produce an alkoxylated phenylchlorosilane at a temperature of −8 to 25° C.; (2) adding at least the stoichiometric amount of water to the mixture of said alkoxylated phenylchlorosilane, trimethylchlorosilane and a phenyl compound selected from the class consisting of diphenyldichlorosilane and diphenylsilane diol to form a mixture of diffusion pump fluids which are phenylsiloxane fluids, and (3) separating all the different fluids by fractional distillation.

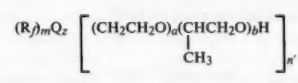
4,289,892

FLUOROCHEMICAL FOAM STABILIZER AND FOAMED POLYURETHANES MADE THEREWITH

Fredrich A. Soch, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 20,113, Mar. 3, 1970, abandoned. This application Apr. 30, 1979, Ser. No. 34,383
Int. Cl.³ C07C *125/077*
U.S. Cl. 560—26 **7 Claims**

1. A fluoroaliphatic radical-substituted polyol having the formula



wherein R_f is a fluorinated, saturated, monovalent, aliphatic, stable, non-polar, inert, oleophobic, hydrophobic radical having 4 to 20 carbon atoms and 40 to 78 weight percent fluorine terminating in at least three fully fluorinated carbon atoms, Q is a linkage free of active hydrogen atoms and has a valence equal to m+n', m is an integer of at least 1, n' is an integer of at least 2, a and b are integers of at least 1, the sum of a+b being at least 5 and the weight ratio of a:b being 20:80 to 80:20, said polyol having a fluorine content of 4–25 weight percent and an average molecular weight of at least 4500, and z is an integer of 1-3.

4,289,893
2,5-INTER-O-PHENYLENE-3,4-DINOR-PGF$_2$ COMPOUNDS

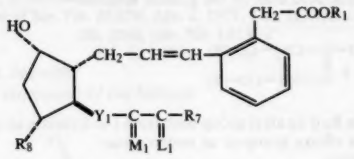
Udo F. Axen, Plainwell, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 62,443, Jul. 31, 1979, which is a continuation-in-part of Ser. No. 962,845, Nov. 22, 1978, abandoned. This application Jul. 3, 1980, Ser. No. 165,599

Int. Cl.[3] **C07C** *177/00*

U.S. Cl. 560—55 **1 Claim**

1. A prostacyclin intermediate of formula VII



wherein

R_8 is hydrogen, hydroxy, or hydroxymethyl;

wherein Y_1 is

(1) trans—CH=CH—,

(2) cis—CH=CH—,

(3) —CH_2CH_2—, or

(4) —C≡C—,

wherein M_1 is α-R_5:β-OH or αOH-β-R_5, wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,

wherein L_1 is αR_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and αR_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_7 is

(1) —$(CH_2)_m$-CH_3, wherein m is an integer from one to 5, inclusive;

(2) phenoxy;

(3) phenoxy substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;

(4) phenyl;

(5) phenyl substituted by one, 2 or 3 chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl;

(6) phenylmethyl, phenylethyl, or phenylpropyl; or

(7) phenylmethyl, phenylethyl, or phenylpropyl substituted by one, two or three chloro, fluoro, trifluoromethyl, alkyl or one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two substituents are other than alkyl; with the proviso that R_7 is phenoxy or substituted phenoxy, only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein R_1 is

(1) hydrogen;

(2) alkyl of one to 12 carbon atoms, inclusive;

(3) cycloalkyl of 3 to 10 carbon atoms, inclusive;

(4) aralkyl of 7 to 12 carbon atoms, inclusive;

(5) phenyl;

(6) phenyl substituted with one, 2 or 3 chloro or alkyl of one to 3 carbon atoms;

(7) phenyl substituted in the para position by

(a) —NH—CO—R_{25},

(b) —CO—R_{26},

(c) —O—CO—R_{27}, or

(d) —CH=N—NH—CO—NH_2,

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is hydroxy, methyl, phenyl, —NH_2, or methoxy; and R_{27} is phenyl or acetaminophenyl, inclusive, or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

4,289,894
PENTACHLOROPHENYL-PHENYL MALONATE COMPOUND SUITABLE FOR USE AS ACYLATING AGENTS

Magda Huhn; Eva Somfai; Gabor Szabo; Gabor Resovszki, and Zoltan Gneth, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegylszeti Termekek Gyara R.T., Budapest, Hungary

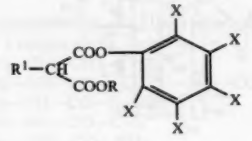
Continuation of Ser. No. 698,063, Jun. 21, 1976. This application Mar. 6, 1979, Ser. No. 17,835

Claims priority, application Hungary, Jun. 20, 1975, OE 22511592

Int. Cl.[3] **C07C** *69/76, 79/46, 101/447*

U.S. Cl. 560—82 **3 Claims**

1. A compound of the formula:



wherein

R is C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_3 to C_8 cycloalkyl, phenyl, halophenyl, naphthyl, benzyl, indanyl, phenacyl, p-nitrophenacyl, xylyl or acetoxymethyl;

R^1 is phenyl, benzyl or phenyl or benzyl substituted by halo, nitro, dialkylamino, alkoxy or trifluoromethyl, lower alkyl or allyl; and

X is halo.

4,289,895
METHOD FOR THE PREPARATION OF OLIGOMERIC ALKYLENE TEREPHTHALATES

Rudolf Burkhardt, Troisdorf; Günther Meyer, Troisdorf-Sieglar; Reinhard Schmidt, Witten, and Klaus Thewalt, Witten-Bommern, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 871,661, Jan. 23, 1978, abandoned, which is a continuation of Ser. No. 653,183, Jan. 28, 1976, abandoned. This application Aug. 13, 1979, Ser. No. 65,823

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1975, 2504258

Int. Cl.[3] **C07C** *69/82*

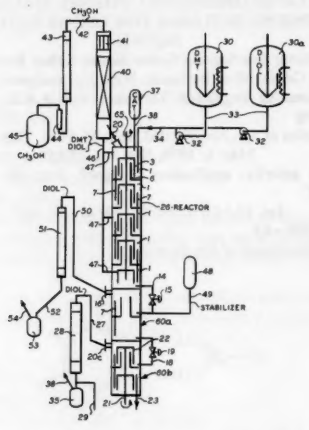
U.S. Cl. 560—92 **13 Claims**

1. Process for production of oligomeric alkylene terephthalates having an average degree of condensation of 4 to 7, a CH_3O content of less than 0.05 wt.%, and a monomeric terephthalic acid dialkanediol ester content of up to 30 wt.%, by transesterification of dimethylterephthalate and diol of 3 to 8 carbon atoms and condensation of the transesterification product, which comprises:

(a) continuously passing the dimethylterephthalate, the diol, and a catalyst for the transesterification through a series of superposed reaction chambers from the uppermost chamber serially to the lowermost chamber, for the transesterification, in liquid phase, methanol being formed in the transesterification reaction and being distilled in the reaction chambers from the liquid phase during the transesterification, and withdrawing the methanol distilled from each chamber without intermixing thereof with the liquid present in any of the other chambers,

(b) the molar proportion of dimethylterephthalate to diol introduced into the reaction chambers being 1:1.1 to 1:1.5,

(c) heating said materials in the reaction chambers so that the temperature in the reaction chambers is in the range of 130°–245° C. and increases stepwise from chamber to chamber, and maintaining the pressure at normal or above normal in said reaction chambers, and stirring the materials during the reaction thereof with stirrers,



(d) passing the transesterification product of the reaction chambers through a vacuum zone maintained at a reduced pressure of 20–300 Torr and temperature of 180°–250° C. for expelling of diol and production of said oligomer and withdrawing the oligmer from the vacuum zone, the temperature in the vacuum zone being higher than the highest temperature in the reaction chambers.

4,289,896

TRANSESTERIFICATION PROCESS

Lothar Buxbaum, Lindenfels, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 17, 1979, Ser. No. 75,789

Claims priority, application Switzerland, Sep. 29, 1978, 10198/78

Int. Cl.³ C07C *67/02*

U.S. Cl. 560—92 **12 Claims**

1. An improved process for the transesterification of an alkyl ester of a mono- or polycarboxylic acid with an aliphatic or cycloaliphatic diol containing at least 3 carbon atoms, in the presence of an acid catalyst, in a temperature range between 180° and 280° C., wherein the improvement comprises

carrying out the transesterification in the presence of a catalytically effective amount of one or more phosphonic acid of the formula

$$RP(O)(OH)_2$$

wherein R is alkyl of 1 to 20 carbon atoms or cycloalkyl of 5 to 6 carbon atoms.

4,289,897

METHOD FOR PRODUCTION OF ACYLHYDRAZONES OF FORMYL-ACETIC ACID ESTER

Hans-Rudolf Krüger, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

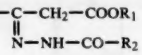
Filed Oct. 10, 1980, Ser. No. 196,150

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2945406

Int. Cl.³ C07C *133/04, 133/00*

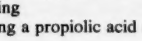
U.S. Cl. 560—159 **10 Claims**

1. A process for the production of acylhydrazones of formyl-acetic acid ester of the general formula



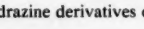
(I)

wherein R_1 is an alkyl group with from 1 to 6 carbon atoms and R_2 is an alkoxy group or an amino group
comprising
contacting a propiolic acid ester of the general formula



(II)

with hydrazine derivatives of the general formula



(III)

in the presence of a solvent.

4,289,898

13,14-DIDEHYDRO-19-OXO-PGE$_2$COMPOUNDS

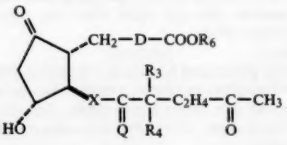
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,963

Int. Cl.³ C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CH$_2$—,
(2) cis—CH=CH—CH$_2$—(CH$_2$)$_g$—CF$_2$—,
(3) cis—CH$_2$CH=CH—CH$_2$—CH$_2$—, or
(4) trans—(CH$_2$)$_3$—CH=CH—; wherein g is zero, one, two, or three; wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl; wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) -(p—Ph)—CO—CH$_3$,
(h) -(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH$_3$,
(i) -(p—Ph)—NH—CO—(p—Ph),
(j) -(p—Ph)—NH—CO—CH$_3$,
(k) -(p—Ph)—NH—CO—NH$_2$,
(l) -(p—Ph)—CH=N—NH—CO—NH$_2$,
(m) β-naphthyl,
(n) —CH$_2$—CO—R_{28}, wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophe-

nyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and wherein X is —C≡C—.

4,289,899

13,14-DIDEHYDRO-19-OXO-PGE$_1$ ANALOGS

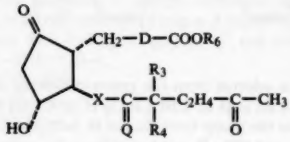
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,972

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or

(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;

wherein g is zero, one, two, or three;

wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,

(g) —(p-Ph)—CO—CH_3,

(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,

(i) —(p-Ph)—NH—CO—(p-Ph),

(j) —(p-Ph)—NH—CO—CH_3,

(k) —(p-Ph)—NH—CO—NH_2,

(l) —(p-Ph)—CH=N—NH—CO—NH_2,

(m) β-naphthyl,

(n) —CH_2—CO—R_{28},

wherein (p-Ph) is para-phenyl or inter-para-phenylene,

wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

wherein X is —C≡C—,

with the proviso that R_6 is hydrogen or alkyl of one to 12 carbon atoms, and R_3, R_4, and R_5 are all hydrogen only when D is not —$(CH_2)_5$—.

4,289,900

13,14-DIDEHYDRO-11-DEOXY-19-OXO-PGE$_2$ COMPOUNDS

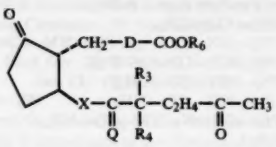
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 131,975

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,

(3) cis—CH_2—CH=CH—CH_2—CH_2—, or

(4) trans—$(CH_2)_3$—CH=CH—;

wherein g is zero, one, two, or three; wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,

(g)—(p—Ph)—CO—CH_3,

(h)—(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,

(i)—(p—Ph)—NH—CO—(p—Ph),

(j)—(p—Ph)—NH—CO—CH_3,

(k)—(p—Ph)—NH—CO—NH_2,

(l)—(p—Ph)—CH=N—NH—CO—NH_2,

(m) β-naphthyl,

(n)—CH_2—CO—R_{28},

wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or

(o) a pharmacologically acceptable cation;

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and wherein X is —C≡C—.

4,289,901

13,14-DIHYDRO-11-DEOXY-19-OXO-PGF$_1$ COMPOUNDS

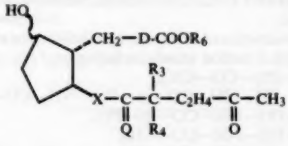
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 20, 1980, Ser. No. 132,007

Int. Cl.^{3} C07C *177/00*

U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or

(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;

wherein g is zero, one, two, or three;

wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;

wherein R_6 is

(a) hydrogen,

(b) alkyl of one to 12 carbon atoms, inclusive,

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —CH_2CH_2—.

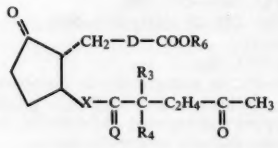
4,289,902

13,14-DIHYDRO-11-DEOXY-19-OXO-PGE$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,030
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein
D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein
g is zero, one, two, or three;
wherein
Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein
R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein
(p—Ph) is para-phenyl or inter-para-phenylene,
wherein
R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein
X is —CH_2CH_2—.

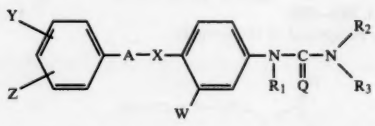
4,289,903

PARA-PHENYLALKOXY PHENYLUREA AND THIOUREA COMPOUNDS AND HERBICIDAL USE THEREOF

David M. Spatz, Trenton, and Barrington Cross, Rocky Hill, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

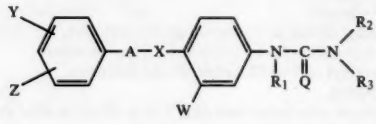
Filed Jun. 25, 1979, Ser. No. 51,584
Int. Cl.^{3} C07C *127/15, 127/17*; A01N *7/00, 17/08*
U.S. Cl. 564—20 **18 Claims**

1. A compound of the formula:



wherein X is selected from the group consisting of O,S, and SO_2; Q is O; R_1 is H or CHO; R_2 is H or C_1–C_4 alkyl; W is selected from the group consisting of H, halogen, C_1–C_4 alkyl, CF_3, OCH_3, and NO_2; R_3 is selected from the group consisting of H, C_1–C_4 alkyl, C_1–C_4 alkyl monosubstituted with either C_1–C_3 alkoxy or halogen, C_3–C_5 alkenyl, C_3–C_5 alkynyl and CHO; A represents C_2–C_3 alkyl; Y is selected from the group consisting of H, halogen, C_1–C_4 alkyl, OCH_3 and CF_3; Z represents H, halogen, C_1–C_4 alkyl, or C_1–C_4 alkoxy.

2. A compound of the formula:



wherein X is O; Q is S; R_1 is H; R_2 is H or C_1–C_4 alkyl; R_3 is C_1–C_4 alkyl; A is C_2–C_3 alkyl; Y or Z is H or halogen; and W is H or halogen.

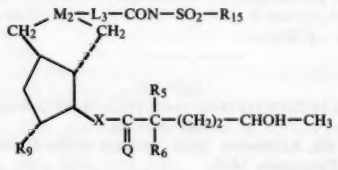
4,289,904

19-HYDROXY-6A-CARBA-PGI$_2$ SULFONYLAMIDES

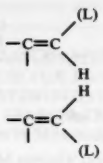
John C. Sih, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 54,811, Jul. 5, 1979, Pat. No. 4,225,508. This application Mar. 3, 1980, Ser. No. 126,467
The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.
Int. Cl.^{3} C07C *143/72, 149/40, 147/107*
U.S. Cl. 564—91 **1 Claim**

1. A prostacyclin-type compound of the formula



wherein L_3 is
(1) —$(CH_2)_n$—, wherein n is one to 5, inclusive,
(2) —$(CH_2)_p$—CF_2—, wherein p is 2, 3, or 4, or
(3) —CH_2—CH=CH—; wherein M_2 is



wherein Q is oxo, α—H:β—H, α—OH:β—R_4, or α—R_4.:β—OH, wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; wherein R_{15} is hydrogen, alkyl of one to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive; wherein R_9 is hydrogen or hydroxyl; and wherein X is

(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—.

4,289,905

2-AZA-1,3-DIENES

Dieter Reinehr, Kandern, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

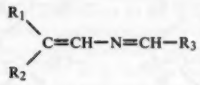
Filed Jul. 10, 1978, Ser. No. 923,438

Claims priority, application Switzerland, Jul. 19, 1977, 8916/77

Int. Cl.³ C07C *119/00*

U.S. Cl. 564—248 **7 Claims**

1. A compound of the formula I



(I)

wherein

R_1 and R_2 independently of one another represent alkyl having 1–8 C atoms, or together with the bond C atom they represent a cycloaliphatic ring having 4–8 C atoms, and

R_3 represents ethyl; or

R_1 represents alkyl having 1–8 C atoms,

R_2 represents hydrogen, or alkyl having 1–8 C atoms, and

R_3 represents tertiary alkyl having 4–8 C atoms.

4,289,906

CHEMICAL PROCESS FOR PREPARING METHYLENE BIS-ANILINES

Kju H. Shin, Bloomfield Hills, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 10, 1979, Ser. No. 101,544

Int. Cl.³ C07C *85/02*

U.S. Cl. 564—330 **7 Claims**

1. A process for making a methylenebisaniline, said process comprising reacting an aromatic amine having an unsubstituted ortho or para position with hydrogen chloride and dimethylsulfoxide.

4,289,907

PROCESS FOR PREPARING N-ALKYL-NITROANILINES

John K. Chan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

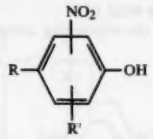
Filed Dec. 27, 1979, Ser. No. 107,537

Int. Cl.³ C07C *85/02, 85/06*

U.S. Cl. 564—399 **7 Claims**

1. A process for producing N-alkyl-nitroaniline comprising:

(a) reacting a nitrophenol of the formula:



where R is a group selected from the class consisting of hydrogen, alkyl, sulfonylalkyl, haloalkyl, alkaryl, aryl, aralkyl, mercaptoalkyl and mercaptoaryl, and wherein R′ is selected from the group consisting of hydrogen, nitro and CF_3, with an alkylating compound selected from the group consisting of ethylene oxide, propylene oxide, styrene oxide, and mixtures thereof, to form an intermediate product, and

(b) reacting said intermediate product with an amine selected from the group consisting of methylamine, ethylamine, isopropylamine, propylamine, butylamine, and mixtures thereof,

to produce said N-alkyl-nitroaniline.

4,289,908

PRODUCTION OF HIGHER AMINES BY THE GAS PHASE HYDROGENATION OF NITRILES

Eckhart R. Becker, Allentown; Randall J. Daughenbaugh, Barto, and Barton Milligan, Coplay, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 19, 1979, Ser. No. 59,000

Int. Cl.³ C07C *85/12*

U.S. Cl. 564—490 **5 Claims**

1. In a process for the catalytic hydrogenation of a lower aliphatic mononitrile having from 2 to 6 carbon atoms in a structure by reacting said nitrile with hydrogen in a reaction zone to form the corresponding amine, the improvement which comprises:

(a) carrying out said reaction at a temperature and pressure such that the hydrogenation reaction is carried out in the gas phase; and

(b) maintaining a feed throughput in the reaction zone such that the gas hourly space velocity is from 2,000 to 12,000.

4,289,909

PROCESS FOR PREPARING 1-DICHLOROACYL-4-SUBSTITUTED PHENOXY BENZENE AND INTERMEDIATES THEREFOR

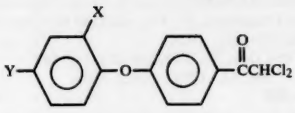
Francis J. Freenor, III, Richmond, and Barbara M. Koerber, Berkeley, both of Calif., assignors to Chevron Research, San Francisco, Calif.

Filed Mar. 3, 1980, Ser. No. 126,252

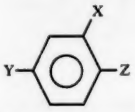
Int. Cl.³ C07C *45/46, 45/63, 41/91*

U.S. Cl. 568—315 **14 Claims**

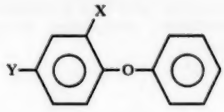
13. A process for preparing a compound having the formula


(F)

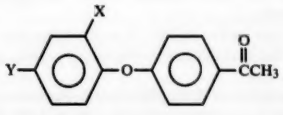
wherein one of X or Y is chloro and the other is trifluoromethyl,
which comprises the steps of
(a) contacting the corresponding compound of the formula


(B)

wherein X and Y are as defined hereinabove and Z is chloro with an alkali metal phenolate in the presence of a catalytically effective amount of powdered copper in dimethylsulfoxide at temperatures in the range of about from 150°–160° C. under substantially anhydrous reactive conditions thereby yielding a compound having the formula


(C)

wherein X and Y are as defined hereinabove
(b) contacting the product of step (a) of formula (C) with acetyl chloride in the presence of about from 1 to 1.15 mols of ferric chloride per mol of said acetyl chloride in methylene chloride at temperatures in the range of about from 15° to 25° C. and wherein about 1 to 1.2 mols of said acetyl chloride are used per mol of the compound of formula C, under substantially anhydrous reactive conditions and wherein said compound of formula C is added at a controlled rate to a mixture comprising said acetyl chloride, said ferric chloride, and said methylene chloride, thereby yielding the corresponding compound of the formula


(E)

wherein X and Y are as defined hereinabove, and;
(c) contacting the product of step (b) of formula E with chlorine in an inert organic solvent at temperatures in the range of about from 40°–55° C. under reactive conditions thereby yielding the corresponding compound of formula F.

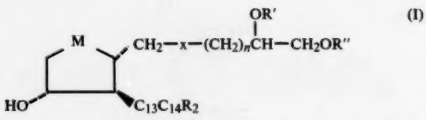
4,289,910

1-HYDROXYMETHYL-PROSTEN-1-OL DERIVATIVES

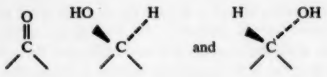
Allan Wissner, Ardsley, and Middleton B. Floyd, Jr., Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 3, 1980, Ser. No. 137,029
Int. Cl.³ C07C *35/06, 49/597*
U.S. Cl. 568—367 **104 Claims**

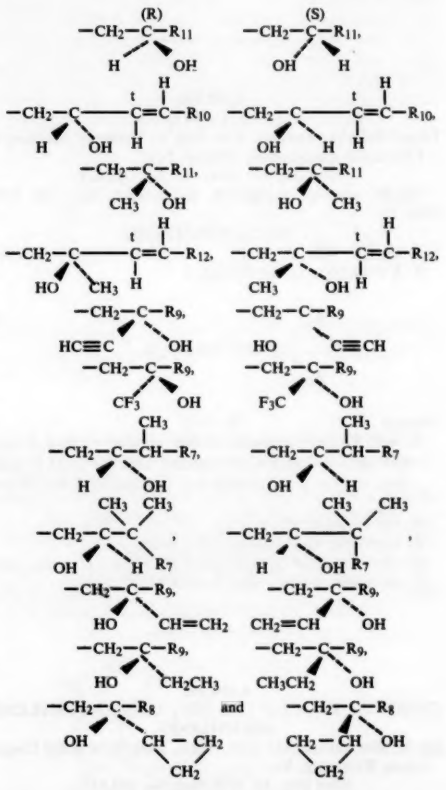
1. Compounds of the formula:


(I)

n is the integer 3-5 inclusive; wherein M is the divalent moiety selected from the group



X is $-CH_2CH_2-$; R′ and R″ are the same or different and are hydrogen, C_1 to C_4 alkyl, C_1 to C_6 alkanoyl or optionally substituted benzoyl, the substituents selected from the group C_1 to C_4 alkoxy, halo and trifluoromethyl; C_{13}–C_{14} is selected from the group —CH=CH—(trans) and $-CH_2CH_2-$; and R_2 is selected from the group



wherein R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_9 is selected from the group consisting of C_3–C_6 alkyl; R_{10} is selected from the group consisting of C_1–C_4 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; R_{12} is selected from the group consisting of C_1 to C_4 alkyl; the racemic mix-

tures thereof; and the mirror images thereof, and the pharmaceutically acceptable, non-toxic salts thereof.

4,289,911

PROCESS FOR PRODUCING METHYLISOBUTYLKETONE

Nobuo Isogai; Takashi Okawa, and Natsuko Wakui, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 9, 1980, Ser. No. 157,539

Claims priority, application Japan, Jun. 13, 1979, 54-74418

Int. Cl.³ C07C *45/45, 29/136*

U.S. Cl. 568—396 **15 Claims**

1. A process for producing methylisobutylketone, which comprises contacting acetone with at least one member selected from the group consisting of water and hydrogen under superatomspheric pressure and under a carbon monoxide atmosphere using: (a) an element of Group VIII of the periodic table, said element being present as a simple substance, an oxide, a hydroxide, a salt, an organic metal complex or a carbonyl; and (b) a halogen selected from the group consisting of iodine and bromine, said halogen being present as elemental halogen, a halogenic acid or a metal salt of a halogenic acid; and (c) a phosphorus compound, said phosphorus compound being present as an alkylphosphine, an alkylphosphine oxide, an alkyl phosphonium salt, or an alkylphosphine sulfide as catalyst at a temperature effective for forming methylisobutylketone, the catalyst's components being present in amounts effective for forming methylisobutylketone.

4,289,912

STABILIZATION OF LIQUID PARAFORMALDEHYDE

Marvin E. Harris, Jr., and Hubert H. Thigpen, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed May 2, 1980, Ser. No. 146,945

Int. Cl.³ C07C *47/04*

U.S. Cl. 568—422 **5 Claims**

1. An aqueous formaldehyde composition characterized by resistance to the deposition of long-chain paraformaldehyde solids therefrom when it is concentrated to a liquid paraformaldehyde containing at least about 80 wt % formaldehyde moiety, which composition consists essentially of water, formaldehyde, and a polymerization moderator selected from the group consisting of polyacrylic acid, tartaric acid, dl-malic acid, ethylenediaminetetraacetic acid, and citric acid.

4,289,913

PROCESS FOR PREPARING 3-(4)-FORMYLTRICYCLO-[5,2,1,0^{2,6}]-DECENE-8

Helmut Bahrmann, Hünxe; Jürgen Weber, Oberhausen, and Boy Cornils, Dinslaken, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 99,121

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928313

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—444 **14 Claims**

1. A process for preparing 3- or 4-formyltricyclo-[5,2,1,0^{2,6}]-decene-8 which comprises contacting dicyclopentadiene with carbon monoxide and hydrogen in the presence of a rhodium catalyst at 110° to 150° C. and 50 to 400 atmospheres, said catalyst being present in an amount of 1 to 30 ppm of rhodium, based upon the amount of dicyclopentadiene employed, said rhodium being present in the form of an organic phosphine - carbon monoxide containing complex, said organic phosphine being an aliphatic straight or branched chain phosphine, a cycloaliphatic phosphine, an aromatic phosphine or an arylaliphatic phosphine or a phosphine with one or more substituted cyclic substituents or an organic phosphine with two or more phosphorus atoms having from 1 to 30 carbon atoms.

4,289,914

COMPOUNDS BY ADDITION OF HYDROPEROXIDES TO α,β-UNSATURATED KETONES

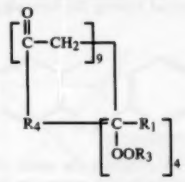
Wilbur H. McKellin, Buffalo, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 727,335, May 7, 1968, Pat. No. 4,257,985. This application Jan. 16, 1980, Ser. No. 112,487

Int. Cl.³ C07C *179/03, 179/025*

U.S. Cl. 568—567 **6 Claims**

1. Alicyclic keto-peroxy compounds of the formula:



where:

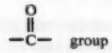
(a) the alicyclic ring may be a single ring or a fused double ring and has 4–10 carbon atoms in the ring;

(b) p is an integer equal to 1–2;

(c) q is an integer equal to 1–4;

(d) p+q is equal to 2–6;

(e) said



group

is joined to a carbon atom α to a ring tertiary carbon atom which is joined to a peroxy oxygen;

(f) R_1 is an aliphatic, cycloaliphatic or aryl radical;

(h) R_3 is an aliphatic or cycloaliphatic radical affording a t-carbon atom which is joined to a peroxy oxygen atom; and

(j) R_6 is an aliphatic biradical.

6. 3,5,5-Trimethyl-3-(t-butylperoxy) cyclohexanone.

4,289,915

HALOGENATED POLYHYDROXY COMPOUNDS AND THEIR DERIVATIVES

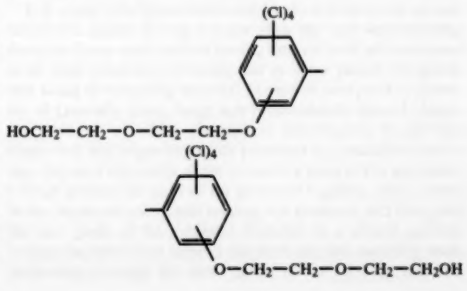
Jacques Vuillemenot, Champ-sur-Frac, and Edouard Grimaud, Oullins, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation-in-part of Ser. No. 776,805, Nov. 18, 1968, abandoned, and a continuation-in-part of Ser. No. 346,078, Feb. 20, 1964, abandoned, and Ser. No. 668,644, Sep. 18, 1967, abandoned. This application Sep. 20, 1971, Ser. No. 182,189

Int. Cl.³ C07C *43/225*

U.S. Cl. 568—609 **1 Claim**

1. A compound consisting essentially of bis(tetrachlorophenoxy ethoxy-ethanol) and having the structure

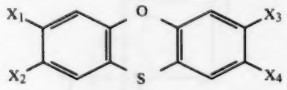


4,289,916
PROCESS FOR PRODUCING P-CHLOROALKYLBENZENE

Yoshiki Nakayama, Shimizu; Chihiro Yazawa, Yokohama, and Koji Yamanashi, Shimizu, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,817
Int. Cl.³ C07C *25/00*
U.S. Cl. 570—209 **5 Claims**

1. A process for producing a p-chloroalkylbenzene which comprises chlorinating an alkylbenzene in the presence of a phenoxthine compound having the formula



wherein X_1, X_2, X_3 and X_4 are the same or different and respectively represent hydrogen atom; an electron attractive group or an electron donative group and a Lewis acid or its precursor as a catalyst.

4,289,917
ALKOXIDES OF 2-PINANOL

Bernard J. Kane, Atlantic Beach, and Sean G. Traynor, Jacksonville, both of Fla., assignors to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 25,734, Mar. 30, 1979, abandoned. This application Aug. 17, 1979, Ser. No. 67,522
Int. Cl.³ C07C *1/253*
U.S. Cl. 585—359 **3 Claims**

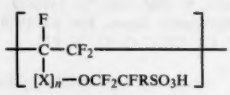
1. A method of improving the reaction rate or yield of an organic chemical reaction which can be affected only under basic conditions wherein said reaction is an elimination reaction which comprises, contacting the reactants of said organic chemical reaction with a pinanoxide base, said base being an alkali metal-2,6,6-trimethyl-bicyclo(3.1.1)-heptan-2-oxide.

4,289,918
ARALKYLATION

Atsushi Sato, Tokyo; Isoo Shimizu, Yokohama, and Masahito Gotoh, Kawasaki, all of Japan, assignors to Nippon Petrochemical Company, Limited, Japan

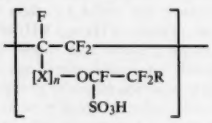
Filed Jul. 23, 1980, Ser. No. 171,465
Claims priority, application Japan, Jul. 24, 1979, 54-93173
Int. Cl.³ C07C *2/72*
U.S. Cl. 585—422 **8 Claims**

1. Method of aralkylating benzene or alkylbenzenes, which method comprises contacting an aromatic olefin having an olefinic double bond conjugated with the benzene ring, with at least one compound selected from benzene and alkylbenzenes containing alkyl group or groups with a total number of carbon atom of the alkyl group or groups ranging from 1 to 18, at a temperature of 50° to 230° C. and in the presence of a perfluoro polymer having at least one repeating unit selected from the units represented by the general formulae



(I)

and



(II)

where,

n is an integer of 0, 1, or 2,

R is a fluorine atom or a perfluoroalkyl group of C_1 to C_{10},

X is $-O(CF_2)_m-$ wherein m is an integer of 1 to 10, $-OCF_2CFY-$, or $-OCFYCF_2-$, and

Y is a fluorine atom or trifluoromethyl group.

4,289,919
CATALYTIC ISOMERIZATION OF AN INTERNAL DOUBLE BOND ALIPHATIC MONO-OLEFIN TO PRODUCE TERMINAL BOND OLEFIN

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

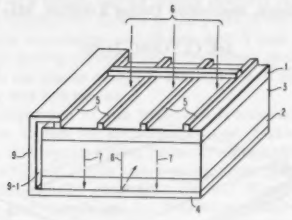
Continuation-in-part of Ser. No. 41,589, May 23, 1979, abandoned. This application Sep. 12, 1980, Ser. No. 186,861
Int. Cl.³ C07C *5/25*
U.S. Cl. 585—664 **7 Claims**

1. A process for the isomerization of an aliphatic mono-olefin hydrocarbon feed to shift an internal double bond therein to produce a corresponding terminal olefin which comprises subjecting said mono-olefin hydrocarbon under isomerization conditions which include a temperature in the approximate range of from about 500° to about 1200° F. to the action of a catalyst comprising a small amount of a manganese oxide supported on an activated alumina, said oxide being present in the approximate range of from about 0.2 to about 8 wt. %, expressed as the element based on the weight of the activated alumina.

4,289,920
MULTIPLE BANDGAP SOLAR CELL ON TRANSPARENT SUBSTRATE

Harold J. Hovel, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,816
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—246 10 Claims

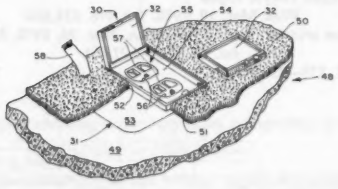


1. A solar cell structure comprising:
an optically transparent, electrically insulating substrate,
at least one semiconductor material on a first upper surface of said substrate,
at least one semiconductor material on a second lower surface of said substrate,
the upper semiconductor material having larger energy bandgap than at least one of the lower semiconductor materials,
first and second photoactive solar cell means in said upper and lower semiconductor materials respectively, at least one of said solar cell means having a Schottky barrier, and
a reflective metal layer covering the bottom surface of the lower semiconductor materials,
said reflective metal layer wrapping around the edge to connect the two solar cell devices in electrical series.

4,289,921
ELECTRICAL ACTIVATING ASSEMBLY AND CLOSURE MEMBER THEREFOR

Rodney W. Gartner; Charles R. Gray, both of Coraopolis, and John O. Hazen, Monaca, all of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 26, 1979, Ser. No. 107,350
Int. Cl.³ H02G *3/12*
U.S. Cl. 174—48 23 Claims

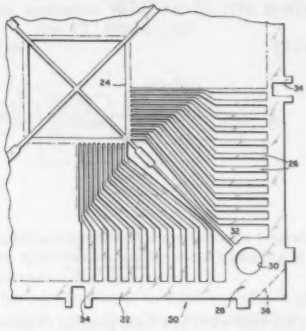


1. A closure member for an electrical outlet comprising: p1 a plate having perimeter edges, a plate outer face and a plate inner face;
an access opening in said plate disposed between the bilateral axis of said plate and one of said perimeter edges;
a perimeter bead surrounding said access opening and being inwardly inset from said perimeter edges, said perimeter bead extending outwardly from said plate outer face and having a bead outer surface remote from said plate outer face, a portion of said plate outer face being enclosed by said perimeter bead;
a cover socket formed by said portion and said perimeter bead; and
a cover fitting within said cover socket and being supported thereby substantially flush with said bead outer surface.

4,289,922
INTEGRATED CIRCUIT PACKAGE AND LEAD FRAME

Daniel J. Devlin, Torrance, Calif., assignor to Plessey Incorporated, New York, N.Y.

Filed Sep. 4, 1979, Ser. No. 71,870
Int. Cl.³ H05K *5/02*
U.S. Cl. 174—52 FP 2 Claims



1. A lead frame for a semiconductor package comprising:
a plurality of leads having their inner tips surrounding a designated circuit area and extending outwardly therefrom to outer ends;
an internal tie bar connecting all said inner tips;
an external frame member connecting all of said leads at said outer ends;
said frame member being quadrilateral and including at least four registration holes on the diagonals thereof referenced to the exact center of said circuit area, whereby package assembly may be keyed to said center;
said frame member additionally including four registration slots on the outer edge thereof on the X and Y axes, said slots being adapted to reference said frame to the center of said circuit area during hot stage assembly steps.

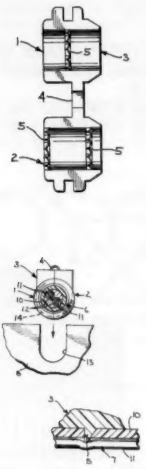
4,289,923
STRAIN RELIEF GROMMET IN COMBINATION WITH A CORD SET EXTENDING FROM AN ELECTRIC MOTOR

Robert W. Ebert, Sauk City, Wis., assignor to Marathon Electric Manufacturing Corp., Wausau, Wis.

Filed Sep. 24, 1979, Ser. No. 77,800
Int. Cl.³ H02G *3/18;* H01B *17/26*
U.S. Cl. 174—65 G 1 Claim

1. A strain relief grommet in combination with a cord set and an electric motor having a frame with the cord set extending from the frame said cord set having internal lead wires encased in an inner insulation covering and an outer jacket, the grommet being of insulating material formed of two parts, a plurality of generally sharp, large size intermittently spaced clamping teeth, all of which are tapered downwardly to provide sharp ends and edges to readily penetrate the insulation covering, disposed internally of the respective parts of the grommet, a hinge joining the parts of the grommet together, and a notch in the frame receiving and holding the grommet and clamping the two parts of the grommet together in a closed position within the notch and around the cord set, the clamping teeth projecting through the outer jacket of the cord set and into

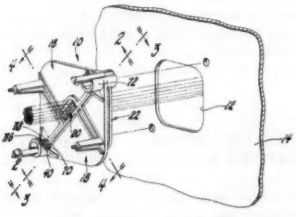
actual contact with the inner insulation covering to place a bite on the inner insulation covering and thereby secure the grommet to the lead wires in a fixed position to prevent removal or loosening of the cord set in service.



4,289,924
INJECTABLE GROMMET ASSEMBLY

Warren Pearce, Jr., Warren; Stephan H. Schramme, Cortland; John L. Lightner, Austintown, and Joseph A. McGee, Warren, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 24, 1980, Ser. No. 190,446
Int. Cl.³ H02G *3/22*; H01B *17/30*
U.S. Cl. 174—152 G **3 Claims**



1. An injectable grommet assembly for passing a bundle of insulated electric wires through a bulkhead comprising

a first shell including a grommet segment having an integral outward flange segment at one end and an inward flange at each end defining an internal cavity,

finger-like means in the cavity for spreading out a bundle of insulated electric wires so that sealant can penetrate between the insulated wires,

a second shell secured to the first shell, said second shell including a grommet segment which cooperates with the grommet segment of the first shell to form an annular sealant chamber for surrounding the bundle of insulated electric wires,

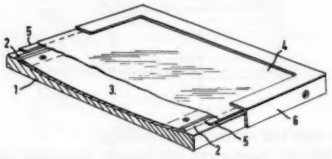
said last mentioned grommet segment having an integral outward flange segment at one end which complements the flange segment of the first shell to provide a mounting flange, and

said flange segments having complementary grooves communicating with the annular sealant chamber.

4,289,925
ELECTROGRAPHIC APPARATUS

Martin R. Lambden, Bourne End, England, assignor to Quest Automation Limited, Dorset, England

Filed May 29, 1979, Ser. No. 43,595
Claims priority, application United Kingdom, May 30, 1978, 23699/78
Int. Cl.³ G08C *21/00*
U.S. Cl. 178—18 **10 Claims**

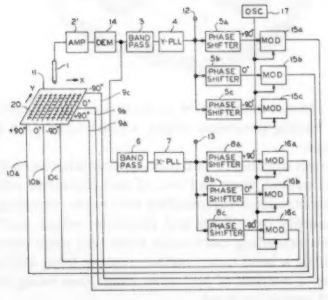


1. In an electrographic apparatus of the type comprising a transducer pad for providing electrical signals representing the coordinates of a location at which pressure is applied locally to a writing surface of the pad by a pen or stylus, the transducer pad including a base member having a conductive surface to which a voltage is applied, the improvement comprising a flexible frame member adapted to be mounted on said base member, a flexible membrane securely mounted on said flexible frame member, said flexible membrane being spaced from said base member and having a conductive surface adapted to make electrical contact with the conductive surface of the base member when a pen or stylus is applied to said flexible membrane, and means for applying voltage to the said conductive surface of said flexible membrane, said flexible frame member comprising four sides each of which is prestressed inwardly during the securing of said flexible membrane thereto and each of which increases in cross section from its ends to its center so as to cause said four sides to produce uniform tensile force in said flexible membrane secured thereto.

4,289,926
TRANSMITTER FOR A TELEWRITER

Masahisa Kobayashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,654
Claims priority, application Japan, Mar. 26, 1979, 54-34229
Int. Cl.³ G08C *21/00*
U.S. Cl. 178—19 **7 Claims**



1. A telewriter transmitter comprising:

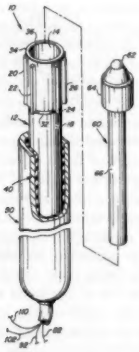
a supporting plate;
a wire assembly having a first array of parellel wires arranged on said plate in an X-axis direction and a second array of parallel wires arranged on said plate in a Y-axis direction perpendicular to the X-axis direction, said arrays defining X and Y coordinates on said plate;
transmission pen means having a point for electrostatically picking up X-axis and Y-axis signals responsive to signals in said first and second arrays, respectively, said X-axis and Y-axis signals having phases uniquely representative of the coordinates closest to the point of the pen;
means for translating said X-axis and Y-axis signals into signals having predetermined frequency deviations relative to the phases of said X-axis and Y-axis signals picked up by said pen means;
means responsive to said translated X-axis and Y-axis frequency signals for providing at least X-axis and Y-axis phase shift signals having phases lying in a preset relationship with said X-axis and Y-axis frequency signals; and
means for equally phase-splitting said X-axis and Y-axis phase shift signals and for distributing them to said wire assembly, carrier wave source means having a frequency which is considerably higher than said X-axis and Y-axis frequency signals; means for amplitude modulating said carrier wave with the outputs of said phase-shifting means; and means for demodulating a signal picked up by said pen.

4,289,927

GRAPHIC COMMUNICATION APPARATUS

James L. Rodgers, Tempe, Ariz., assignor to Kurta Corporation, Tempe, Ariz.

Filed Nov. 13, 1979, Ser. No. 93,620
Int. Cl.³ G08C *21/00*
U.S. Cl. 178—19 **20 Claims**



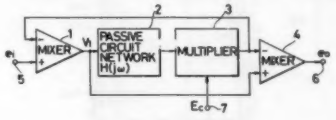
1. Graphic communication apparatus, comprising, in combination:
a writing surface;
pen means movable on the writing surface for graphically portraying information on the writing surface;
input signal means for providing an input signal to the pen means;
pen coil means, including a plurality of pen coils, disposed in the pen means for producing a magnetic field in response to the input signal as the pen moves on the writing surface;
sense coil means for sensing the magnetic field produced by the pen coil means and for producing output signals in response thereto, including
X direction sense coil means for sensing the magnetic field produced by the pen coil means in an X direction, and
Y direction sense coil means for sensing the magnetic field produced by the pen coil means in a Y direction; and
circuitry means connected to the sense coil means for receiving the output signal from the sense coil means and for producing an output signal representative of the location of the pen means on the writing surface.

4,289,928

TONE CONTROL ARRANGEMENT FOR USE IN SOUND REPRODUCING INSTRUMENTS

Saburo Takaoka, and Ryozi Higashi, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 21, 1977, Ser. No. 817,649
Claims priority, application Japan, Jul. 23, 1976, 51-87238
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—1 D **17 Claims**



1. A tone control arrangement for use in sound reproducing instruments, said tone control arrangement including at least one tone control circuit unit comprising:
a first mixer having a first input terminal to which is applied an audible sound signal to be frequency controlled and a second input terminal;
a passive circuit network coupled to the output terminal of the first mixer and having an amplitude transmission characteristic determined by a desired frequency response of the tone control arrangement;
a variable d.c. voltage source;
a multiplier coupled to the passive circuit network and the variable d.c. voltage source to multiply an output signal derived from the former with a variable d.c. voltage from the latter, an output signal from the multiplier being applied to the second input terminal of the first mixer; and
a second mixer having a first input terminal coupled to the output signal of the multiplier and a second input terminal coupled to the output terminal of the first mixer, said second mixer having
an output terminal coupled to the output terminal of the tone control arrangement.

4,289,929

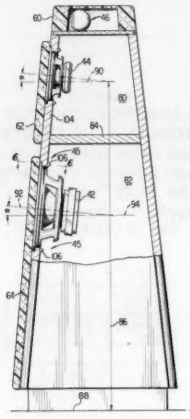
LOUDSPEAKER AND ENCLOSURE COMBINATION

Dana B. Hathaway, Amesbery, Mass., assignor to Epicure Products, Inc., Newburyport, Mass.

Filed Sep. 11, 1979, Ser. No. 74,508
Int. Cl.³ H04R *1/20*; H05K *5/00*
U.S. Cl. 179—1 E **12 Claims**

1. A loudspeaker enclosure and loudspeaker in combination, comprising:
a hollow closed structure formed as a truncated pyramid having vertical edges smoothly rounded, and having one side with an aperture formed therein, and
a loudspeaker arranged internal to said hollow closed structure and mounted on said one side of said truncated pyramid for radiating sound through said aperture in said one side,
said loudspeaker having a center, and said one side of said truncated pyramid and said loudspeaker having a dimensional relationship therebetween so that a horizontal plane passing through said center of said loudspeaker passes

through a section of said one side of said truncated pyramid, said section being smaller in length than the



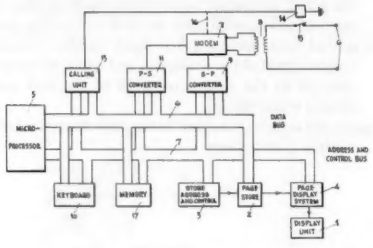
wavelengths of the sounds to be radiated by said loudspeaker.

4,289,930

ELECTRONIC APPARATUS FOR THE DISPLAY OF INFORMATION RECEIVED OVER A LINE

David C. A. Connolly, Hong Kong, Hong Kong, and Harry Shutt, Darlington, England, assignors to The General Electric Company Limited, London, England

Filed Nov. 30, 1978, Ser. No. 965,041
Int. Cl.³ H04M *11/08*
U.S. Cl. 179—2 TV **5 Claims**



1. Electronic apparatus for the display of pages of information signalled from a remote location in response to a request for the information being signalled by the apparatus to the remote location, the apparatus comprising:

(A) a pair of terminals for connection to a transmission line,

(B) a raster-type display unit responsive to video signals for controlling the display thereof,

(C) a data store for storing data representing in digitally-coded form characters to be displayed by the display unit,

(D) means to write character identifying data into the data store in response to signals which are applied to the pair of terminals and which carry the data,

(E) video signal generating means to derive said video signal from the data stored by the data store for supply to the display unit,

(F) a keyboard,

(G) an electrically-alterable memory,

(H) means to enter into the memory in response to operation of the keyboard, data identifying selected pages of information which are to be transmitted from the remote location, and

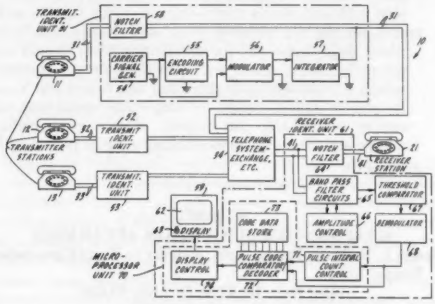
(I) means responsive to further operation of the keyboard to supply to the pair of terminals for transmission to the remote location signals characterizing at least some of the data stored by the memory and identifying a particular one of the selected pages of information.

4,289,931

SECURITY IDENTIFICATION SYSTEM USING PULSE CODE MODULATION

Donald G. Baker, Wildwood, Ill., assignor to Micro-Tek, Inc., Atlanta, Ga.

Filed Nov. 28, 1979, Ser. No. 95,004
Int. Cl.³ H04M *1/57*
U.S. Cl. 179—5.5 **10 Claims**



7. A transmitter identification unit for connection to the telephone line of an individual transmitter station in a telephone transmission system, as a part of a security identification system for the telephone transmission system, comprising:

a carrier signal generator, including a stabilized oscillator, for developing a carrier signal at a frequency F;

an encoding circuit, utilizing the carrier signal as a synchronizing signal, for developing a pulse code signal including a repeating sequence of uncoded and coded signal segments, each uncoded signal segment comprising a series of N pulse intervals of fixed duration D, each coded signal segment comprising a series of M pulse intervals of fixed duration D, with coding effected by the presence or absence of pulses in those intervals, with $F >> 1/D$,

a modulator for modulating the carrier signal with the pulse code signal to generate an identification signal corresponding to the pulse code signal but with each code pulse comprising a burst of cycles of the carrier signal;

coupling means for applying the identification signal to the telephone line of a transmitter station;

and filter means for interposition in the telephone line to preclude transmission of the identification signal to the transmitter station.

4,289,932

CONFERENCING COMMUNICATIONS SYSTEM

Roger R. Reed, 31 Hutchinson St., Arlington, Mass. 02174

Filed Oct. 15, 1979, Ser. No. 84,907
Int. Cl.³ H04M *3/56*
U.S. Cl. 179—18 BC **22 Claims**

1. A system for conferencing a plurality of stations comprising:

a plurality of signal originating stations;

a plurality of signal receiving stations;

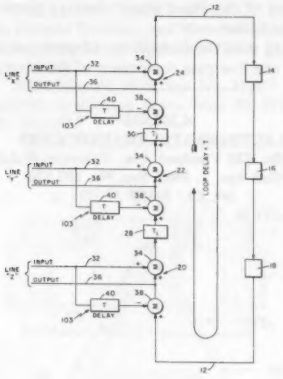
means for defining a predetermind time interval;

means for identifying at least one of said signal originating stations and at least one of said signal receiving stations for communication each with the other;

at least some of said signal originating stations and at least

some of said signal receiving stations being identified as associated one with the other in conference communication;

means for applying to each of the identified signal receiving stations a signal consisting of the combination of signals generated by each of the identified signal originating



stations over a period of time defined by said time interval with signals originated by the signal originating station associated with that signal receiving station delayed said predetermined interval so as to cancel in the signals applied to each receiving station the signals originated by the associated originating station.

4,289,933

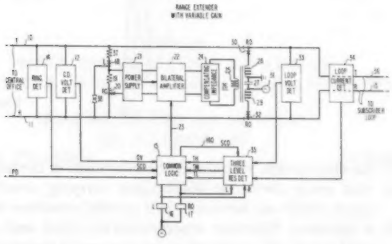
DIAL PULSE DETECTION

James L. Henry, Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 15, 1979, Ser. No. 84,916

Int. Cl.³ H04B 3/40

U.S. Cl. 179—18 FA **7 Claims**



1. A telephone loop supervisory detector comprising

a differential amplifier having two inputs and one output,

a voltage sensor for applying a first signal across a first voltage divider, a midpoint of which is connected to one of said inputs, and

a current sensor for applying a second signal across a second voltage divider, a midpoint of which is connected to the other of said inputs,

said detector

characterized by

a capacitor, and

means for selectively connecting said capacitor to one of said midpoints to dynamically modify the threshold of detection of said supervisory detector.

4,289,934

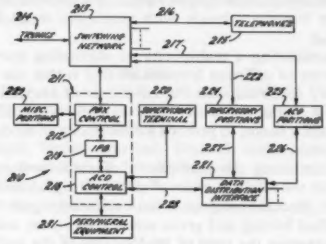
INTEGRATED AUTOMATIC CALL DISTRIBUTION FACILITY AND PBX SYSTEM

Satyan G. Pitroda, Villa Park, Ill., and Madhukumar A. Mehta, Baroda, India, assignors to Wescom Switching Inc., Downers Grove, Ill.

Filed Apr. 25, 1979, Ser. No. 33,245

Int. Cl.³ H04Q 3/54, 3/64

U.S. Cl. 179—27 D **7 Claims**



1. An automatic call distribution and telecommunications switching system comprising:

a. a switching network having a plurality of access ports including a first group of access ports coupled by a first group of lines to a group of automatic call distribution positions; and

b. a control complex having:

1. first microprocessor control means selectively establishing connections between said access ports, thereby performing the functions of a telephone switching exchange,

2. second microprocessor control means for communicating data on data lines other than said first group of lines with the automatic call distribution group of positions, each of said positions being coupled to a different access port of said first group of access ports, and

3. means for transferring data messages between said first and second microprocessor control means, the second microprocessor control means including means for directing the first microprocessor control means to establish connections selected by the second microprocessor control means with said first group of access ports.

4,289,935

METHOD FOR GENERATING ACOUSTICAL VOICE SIGNALS FOR PERSONS EXTREMELY HARD OF HEARING AND A DEVICE FOR IMPLEMENTING THIS METHOD

Manfred Zollner; Christian Hoffmann, both of Munich, and Eberhard Zwicker, Icking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 27, 1980, Ser. No. 125,046

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1979, 2908999

Int. Cl.³ H04R 25/00

U.S. Cl. 179—107 FD **33 Claims**

1. A method for generating acoustical voice signals which are intelligible to persons extremely hard of hearing, but having a sensory response to frequencies in a given sensory spectrum, comprising:

(a) supplying an input signal in accordance with an acoustical voice signal to be made intelligible to an individual with a given sensory spectrum,

(b) dividing the input signal into a plurality of frequency bands to provide output signals of different frequency bands,

(c) modulating alternating waveform signals of different

frequencies within the given sensory spectrum with the envelopes of the output signals of said different frequency bands, to provide modulated tone signals,

(d) combining the modulated tone signals with frequency components of the input signal, and supplying the resultant signal to the individual having said given sensory spectrum,

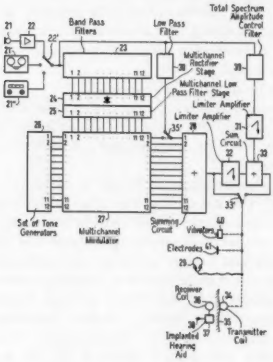
wherein the improvement comprises

(e) dividing the input signal in accordance with the acoustical voice signal, into at least three frequency bands to thereby provide output signals in a multiplicity of different frequency bands with respective mean frequencies (f_m),

(f) modulating a multiplicity of alternating current waveforms of different frequencies (f_G) within the given sensory spectrum with the envelopes of respective ones of said output signals in said multiplicity of different frequency bands, to provide a multiplicity of modulated tone signals,

(g) combining the multiplicity of modulated tone signals with the total spectrum of said input signal, and supplying the resultant total spectrum combined signal to the individual having said given sensory spectrum, and

(h) adjusting the ratio of the loudness of the multiplicity of modulated tone signals with respect to the loudness of said input signal, and also adjusting the loudness of the resultant total spectrum combined signal, both adjustments being made in relation to the specific sensory characteristics of the individual person having said given sensory spectrum.



30. A method for generating acoustical voice signals which are intelligible to persons extremely hard of hearing, but having a sensory response to frequencies in a given sensory spectrum, comprising:

(a) supplying an input signal in accordance with an acoustical voice signal to be made intelligible to an individual with a given sensory spectrum

(b) dividing the input signal into a plurality of frequency bands to provide output signals of different frequency bands,

(c) modulating alternating waveform signals of different frequencies within the given sensory spectrum with the envelopes of the output signals of said different frequency bands, to provide modulated tone signals,

(d) combining the modulated tone signals with frequency components of the input signal, and supplying the resultant signal to the individual having said given sensory spectrum,

wherein the improvement comprises

(e) dividing the input signal in accordance with the acoutical voice signal, into at least three frequency bands to thereby provide output signals in a multiplicity of different frequency bands with respective mean frequencies (f_m),

(f) modulating a multiplicity of alternating current waveforms of different frequencies (f_G) within the given sensory spectrum with the envelopes of respective ones of said output signals in said multiplicity of different frequency bands, to provide a multiplicity of modulated tone signals,

(g) selecting the different frequencies (f_G) of the alternating current waveforms to be proportionate with respective frequencies of the input signal above a given low frequency limit, and

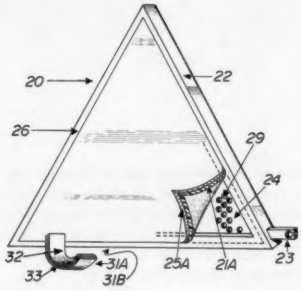
(h) combining with the multiplicity of modulated tone signals only one low pass component of the input signal.

4,289,936

ELECTROSTATIC TRANSDUCERS

John P. Civitello, 226 Vreeland Ave., Paterson, N.J. 07504

Filed Apr. 7, 1980, Ser. No. 137,576
Int. Cl.[3] **H04R** *19/00*
U.S. Cl. 179—111 R **1 Claim**



1. An electrostatic transducer the combination comprising:

a. two outer dielectric diaphragms carrying conductive layers which are laminated in a parallel condition to

b. a one-piece dielectric spacer/centrally fixed and perforated conductive grid serving as an essential skeletal structure wherein

c. geodesically-curved transducer arrays are configured and result in broadened sound radiation patterns in the vertical and horizontal dimensions of the listening area

d. non-resonant dampening means for joining adjacent transducers thereby decoupling adjoining speaker units without loss of structural integrity

e. a laminated dielectric/conductive tab which serves as a diaphragm signal connection electrode as well as a diaphragm interconnecting system allowing adjacently curved geodesic diaphragms to be "interwired" without bulky connectors or strands of wire

f. a transformer to which its primary winding is supplied a signal voltage and to which its secondary winding is connected across said electrostatic transducer's dia-

phragm conductive layers; and, there being an additional connection of a high voltage d.c. biasing potential to said electrostatic transducer's fixed conductive grid via its electrode connection point.

4,289,937

SPEAKER WITH FINE GRAIN FERROMAGNETIC MATERIAL ON CENTER POLE OR RING

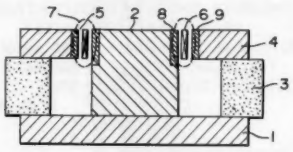
Hideo Ikeda; Hideshi Tsuchiya, and Masaru Okada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1979, Ser. No. 37,893

Claims priority, application Japan, May 30, 1978, 53-64727; Jun. 7, 1978, 53-68684

Int. Cl.[3] H01F *1/00;* H04R *9/06*

U.S. Cl. 179—119 R 6 Claims



1. A speaker comprising a disc yoke, a ring permanent magnet and centerpole on said yoke, a ring plate on said ring permanent magnet, said centerpole and ring plate being placed so as to create an air gap, and a voice coil placed in said air gap;

wherein said voice coil produces an AC magnetic field when AC signal current passes through the voice coil;

wherein at least one of the areas of said centerpole and said ring plate which face said voice coil is formed of different material from the remaining portions of said centerpole and said ring plate, said different material being a ferromagnetic material with fine crystalline grains having an average of sixteen (16) or more grains per twenty-five square millimeters of field of view of a microscope at magnification of 100, and having a reduced magnetic domain size;

wherein the different material produces a substantially linear magnetic minor hysteresis loop for the magnetic circuit of the speaker.

4,289,938

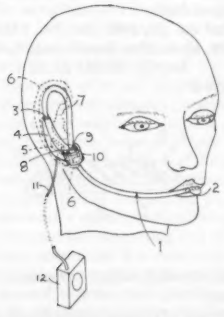
VOICE AMPLIFICATION APPARATUS

Theodore B. R. Zichy, 8 Sandwich St., London, WC1H 9PL, England

Filed Nov. 23, 1979, Ser. No. 96,675

Int. Cl.[3] H04M *1/05*

U.S. Cl. 179—156 A 3 Claims



1. Voice amplification apparatus including a microphone unit; a housing for the microphone unit which is shaped so as to be able to lie behind or substantially behind the ear of the user; an elongate self supporting sound energy guide tube attachable at one end to the housing, the sound energy guide tube being shaped to provide a loop which engages over the user's ear to provide suspension means for supporting the housing adjacent the user's ear, and which loop is adjustable for the purposes of obtaining a desired degree of fit of the loop to the user's ear, the shaping of the sound energy guide tube also being such that when the housing is supported adjacent the user's ear a sound energy input end is presented adjacent to the user's mouth.

4,289,939

LONGITUDINAL BALANCE ARRANGEMENTS FOR TWO-TO-FOUR WIRE TELECOMMUNICATION LINE CIRCUITS

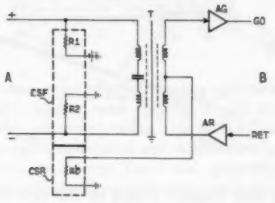
John S. Arnold, Nether Heyford, England, assignor to The Plessey Company Limited, Ilford, England

Filed Dec. 28, 1979, Ser. No. 108,179

Claims priority, application United Kingdom, Dec. 30, 1978, 50385/78

Int. Cl.[3] H04M *1/76*

U.S. Cl. 179—170 D 3 Claims



1. A two-to-four wire telecommunications line circuit including line current feed resistors connected to the subscribers line on the two-wire side of the line circuit and a balance impedance connected in the four-wire side of the line circuit and the balance impedance includes a resistive component which is thermally coupled to the line feed resistors and is formed of a resistive material having a negative temperature co-efficient.

4,289,940

KEYBOARD SWITCH COVERING PADS

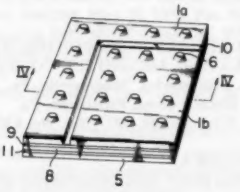
Ryoichi Sado, Saitama, and Yoshitusgu Morikawa, Tokyo, both of Japan, assignors to Shin-Etsu Polymer Company, Ltd., Tokyo, Japan

Filed Nov. 21, 1979, Ser. No. 96,513

Claims priority, application Japan, Nov. 24, 1978, 53-161710[U]

Int. Cl.[3] H01H *9/26;* B32B *3/10*

U.S. Cl. 200—5 A 2 Claims



1. A keyboard switch covering pad mountable on a printed circuit forming a common circuit between the keyboard switch covering pad and the printed circuit which comprises (a) an electrically conductive rubber sheet having a plurality of

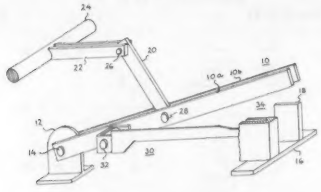
fixed contact points and a plurality of switching contact points on one side thereof, said conductive rubber sheet being divided into at least two sections each having at least one fixed contact point and at least one switching contact point said conductive rubber sheet being completely free of openings, and (b) an electrically insulating sheet having a plurality of openings, on which the conductive rubber sheet as divided into sections is bonded in such a manner that each of the fixed contact points and the switching contact points penetrate one of the openings, the divided sections of the conductive rubber sheet are electrically insulated from each other and said electrically insulating sheet being provided with a layer of an adhesive on the surface thereof opposite to the electrically conductive rubber sheet for the mounting of same to said printed circuit.

4,289,941

LOAD BREAK SWITCH ARC SUPPRESSION

John W. Cannon, Roanoke, Va., assignor to General Electric Company, New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,430
Int. Cl.[3] H01H *33/12, 9/38*
U.S. Cl. 200—146 R **16 Claims**



1. In a load breaker switch of the type comprising main contact members adapted to be disengaged from one another, auxiliary stationary contact means and auxiliary moveable contact means adapted to engage one another and to make contact while the main contact members disengage and to thereafter break contact by rapid movement of the auxiliary stationary member along a predetermined path to an open position, the combination comprising:

(a) means to prevent disengagement and movement of said auxiliary moveable contact means until after disengagement of said main contact members;

(b) arc supporting means secured adjacent to, and connected in a low impedance electrical circuit with said auxiliary stationary contact means;

(c) said arc supporting means being disposed adjacent to the path of movement of said auxiliary moveable member at a position of the path intermediate said auxiliary stationary member and said open position to provide for transfer of arc attachment from said auxiliary stationary member upon disengagement of said auxiliary members so as to reduce physical deterioration of said auxiliary stationary member.

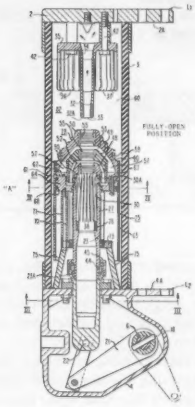
4,289,942

GAS-BLAST CIRCUIT-INTERRUPTER WITH MULTIPLE INSULATING ARC-SHIELD CONSTRUCTION

Stanislaw A. Milianowicz, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1977, Ser. No. 820,176
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 A **22 Claims**

1. A gas-type puffer circuit-interrupting structure including, in combination, means defining casing means, a relatively stationary contact-rod disposed within said casing means, means defining a fixed piston structure disposed within the casing means, a movable operating cylinder assembly carrying a movable contact and operatively slidable over said fixed piston structure to compress gas therebetween within a piston chamber for arc-extinction purposes, a multiple hollow insulating nozzle assembly also affixed to said movable operating cylinder assembly and surrounding said relatively stationary contact-rod in the closed circuit position of the circuit-interrupting structure, said movable nozzle assembly including at least a pair of axially-spaced insulating nozzles defining a gas-inlet passage therebetween, said gas-inlet passage being in communication with said piston chamber, one nozzle being situated close to the tip of the movable contact so that said stationary contact-rod blocks said gas-inlet passage in the closed-circuit position of the circuit-interrupting structure when the two aforesaid separable contacts are in closed contacting engagement, means effecting opening movement of said operating cylinder assembly during the opening operation



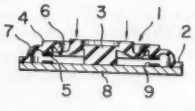
of the circuit interrupting structure so that said movable operating cylinder assembly slides over said fixed piston structure to thereby simultaneously effect contact separation and also compression of gas within said piston chamber, and the blocking action of said rod-shaped stationary contact within said one insulating nozzle delaying flow of compressed gas out of the piston chamber and through said gas inlet passage for a predetermined time after said contact separation, thereby enabling a substantial predetermined arc-length to be achieved between said stationary contact rod and said movable contact prior to unplugging said one nozzle, whereby compressed gas will then flow at this time through said one gas-inlet passage into the established arc for arc-extinction purposes.

4,289,943

PUSH-BUTTON SWITCHES

Ryoichi Sado, Saitama, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1980, Ser. No. 173,330
Claims priority, application Japan, Aug. 6, 1979, 54-100107
Int. Cl.[3] H01H *13/52*
U.S. Cl. 200—159 B **2 Claims**



1. A push-button switch which comprises

(a) a base plate,

(b) at least one pair of contact points fixedly provided on the base plate;

(c) a curved diaphragm covering made of an elastically resilient material to cover the contact points on the base

plate, a part of which is shaped in a form of a snap spring or a click spring so as that the part moves toward the contact points when a pushing force is applied to the top of the diaphragm covering but, when the movement toward the contact points exceeds a limit, spontaneously and rapidly snaps back in the reverse direction to come apart from the contact points, and

(d) at least one movable contact member provided on the inward surface of the diaphragm covering at the part of the snap spring so as to come into contact with the contact points on the base plate to close the electric circuit therebetween when the diaphragm covering is pushed toward the contact points and to come out of contact with the contact points when the diaphragm covering is snapped back.

4,289,944

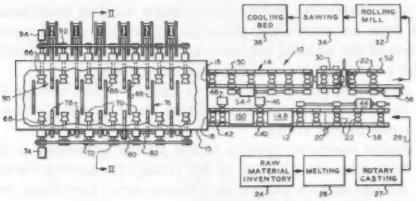
APPARATUS FOR REHEATING, STORING AND CONVEYING CAST BARS

Thurston F. Reese, 4929 S. Meridian Rd., Jackson, Mich. 49204

Filed Dec. 19, 1977, Ser. No. 862,117

Int. Cl.³ H05B *6/06;* **F27D** *3/02;* **B65G** *47/30*

U.S. Cl. 219—10.41 **6 Claims**



1. The method of reheating and controlling the movement of elongated steel bars having ends wherein the bars are formed by an axial movement casting process causing the bars to cool from a previously heated condition such that the bar temperature varies throughout the bar axial length intermediate said ends and the bars are transported by conveyors from a caster to a plurality of treatment stations, comprising the steps of placing the bars upon a first conveyor at random, non-periodic intervals for axial movement thereon, axially translating the bars through a heated zone of lesser length in the axial direction of the bars than the bar's length at a rate of axial translation proportional to the temperature of that portion of a bar within the heated zone whereby the heat content of the bar exiting the heated zone is substantially uniform throughout the bar length, conveying the heated bar to storage means, storing the heated bars in the storage means, and removing the bars from the storage means at predetermined intervals by a second conveyor for processing at the treatment stations.

3. A furnace for metal bars and the like comprising, it combination, a thermally insulated housing having a floor, a top panel, spaced lateral walls and end walls defining a heated chamber, first and second bar conveyors located within said furnace spaced from each other and adapted to axially convey elongated bars in spaced, substantially parallel paths, bar supporting and storing means within said furnace comprising skids intermediate said conveyors receiving bars from said first conveyor, unloading means within said furnace transfering bars from said first conveyor onto said supporting and storing means, said unloading means comprising pivoted bar lifting means movable between a raised position lifting a bar from said first conveyor onto said bar supporting and storing means and a retracted position below said first conveyor, first expansible motor means operatively connected to said unloading means for movement thereof between said positions, loading means within said furnace adjacent said supporting and storing means and said second conveyor loading said bars on said second conveyor from said storage means, said loading means comprising a plurality of pivotally mounted arms movable between an inoperative retracted position, a lower position and an elevated position, said arms removing a bar from said bar supporting and storing means and raising said bar to said second conveyor upon moving from said lower position to said elevated position, and second expansible motor means operatively connected to said arms for selectively translating said arms between said retracted, lower and elevated positions.

4,289,945

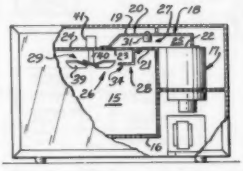
ENERGY TRANSMISSION AND DISTRIBUTION SYSTEM FOR A MICROWAVE OVEN

Mark J. Kristof, Marion Township, Marion County, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 17, 1979, Ser. No. 85,893

Int. Cl.³ H05B *6/74*

U.S. Cl. 219—10.55 F **16 Claims**



1. In a microwave oven structure having wall means defining an oven cavity and an inlet opening to said cavity, and microwave energy generating means externally of said cavity, an improved energy transmission and distribution system for delivering microwave energy from said generating means through said inlet opening into said cavity, said system comprising:

a waveguide member extending in communicating relationship from said generating means to said inlet opening;

impedance matching means within said waveguide for matching the impedance of said cavity and said waveguide to said generating means;

shield means within said cavity adjacent said inlet opening for deflecting microwave energy passed through said inlet opening into said cavity; and

stirrer means within said cavity and adjacent said inlet opening and said deflector, said impedance matching means, shield means, and stirrer means being accurately sized and located for cooperatively causing effectively optimized uniform distribution of said microwave energy in said oven structure.

4,289,946

ELECTROMAGNETIC CASTING APPARATUS

John C. Yarwood, Madison; Ik Y. Yun, Orange; Derek E. Tyler, Cheshire, and Peter J. Kindlmann, Northford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 905,889, May 15, 1978, Pat. No. 4,161,206. This application Dec. 26, 1978, Ser. No. 973,475

Int. Cl.³ H05B *6/06;* **G01R** *27/26;* **B22D** *27/02*

U.S. Cl. 164—503 **13 Claims**

1. In an apparatus for casting materials such as metals comprising:

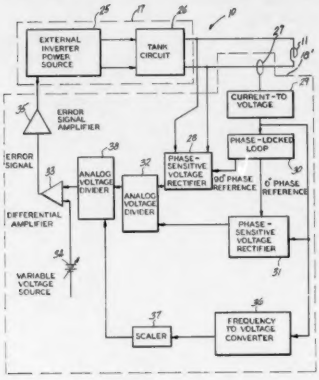
induction means for applying a magnetic field to said material and solid state inverter means for applying an alternating current to said induction means to generate said magnetic field the improvement wherein:

means are provided for sensing a reactive parameter corresponding about to the reactance or inductance of said induction means, said reactive parameter sensing means comprising:

means for sensing a voltage signal applied to said induction means;

means for sensing a current signal applied to said induction means;

circuit means for filtering said voltage and current signals to extract the fundamental frequency thereof; and



circuit means receiving said filtered voltage and current signals for generating a signal corresponding about to said reactance or inductance of said induction means.

4,289,947

FLUID JETTING SYSTEM FOR ELECTRICAL MACHINING

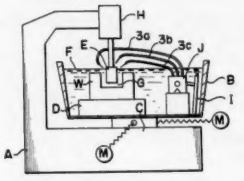
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jan. 19, 1979, Ser. No. 4,987

Claims priority, application Japan, Mar. 2, 1978, 53-25633[U]; Aug. 28, 1978, 53-117434[U]

Int. Cl.³ B23P *1/04*

U.S. Cl. 219—69 D **24 Claims**



1. In an electrical machining apparatus, in combination a workpiece, an electrode spacedly juxtaposed with said workpiece and defining a single machining gap, and a fluid-jetting system, said fluid-jetting system comprising:

a fluid source;

a distribution chamber with an inlet connected to said source for receiving an electrical machining fluid therefrom and for distributing the received fluid into a plurality of streams; and

a plurality of fluid distribution delivery nozzle tubes which are flexible, self sustaining and bendable commonly leading from said distribution chamber and having their respective ends in the form of nozzles positionable independently of said electrode and orientable as desired by manipulating the flexibility of said tubes in different zones in the region of said single machining gap respectively for conducting and directing said distributed streams of said machining fluid from said distribution chamber into said desired different zones in the region of said single machining gap.

4,289,948

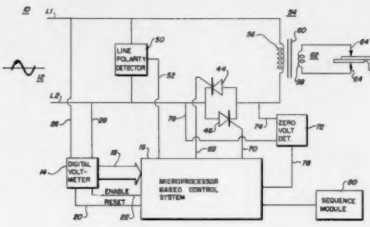
AUTOMATIC VOLTAGE COMPENSATION FOR DIGITAL WELDER CONTROL SYSTEM

Dennis J. Jurek, Grafton; Marvin A. Guettel, Milwaukee, and Michael Aslin, Cedarburg, all of Wis., assignors to Square D Company, Palatine, Ill.

Filed Jul. 17, 1979, Ser. No. 58,356

Int. Cl.³ B23K *11/24*

U.S. Cl. 219—110 **2 Claims**



1. A digital welder control system for a resistance welder of the type connecting and disconnecting a welding transformer load from an alternating electrical source to control timing periods of the welding sequence and the level of heat intensity in the weld to insure quality welds, comprising:

a means responsive to a polarity change in line voltage for generating a signal representing the beginning of each cycle of line voltage;

a digital means responsive to the signals generated at the beginning of each cycle of line voltage for sensing the line voltage and for producing a digital signal therefrom proportional to the average line voltage, said digital signal being accumulated in said sensing and producing means for a period of one cycle of the line voltage; and

a digital control means responsive to the accumulated digital signal of each cycle of line voltage, for adjusting the welding current by altering the timing of the firing points of the welding contactors in a next proceeding line voltage cycle and for maintaining the welding current constant and independent of line voltage variations.

4,289,949

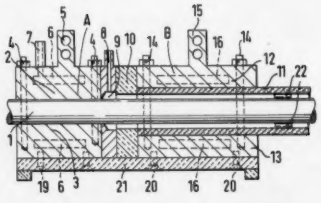
PLASMA BURNERS

Ola S. Raaness, Saupstad, and Jon A. Bakken, Trondheim, both of Norway, assignors to SINTEF (Selskapet for Industriell og Teknisk Forskning ved NTH), Trondheim, Norway

Filed Jun. 6, 1979, Ser. No. 46,023

Int. Cl.³ B23K *9/00*

U.S. Cl. 219—121 PR **8 Claims**



1. Plasma burner comprising a centrally arranged electrode, an outer electrode and an electrode holder for the support of said electrodes, means for applying an electrical voltage for producing an electric arc between the electrodes and means for the supply of gas to the electric arc area of said electrodes, the electrodes being made of a non-melting and subliming material to constitute a continuously consumable system in which said

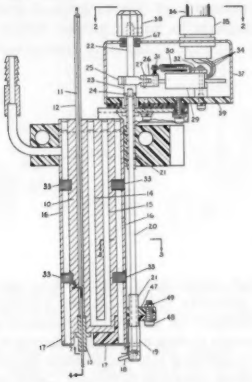
outer electrode has the shape of a pipe and said centrally arranged electrode has a shape selected from that of a row and a pipe and is coaxially arranged within said outer electrode so as to define therebetween an elongate passage of annular cross-section, and said electrode holder being designed to conduct gas through said passage forwards to a front, free end of the electrodes where the electric discharge occurs from the end of said inner electrode.

4,289,950

NARROW GAP WELDING APPARATUS

Elmer L. Griebeler, Cleveland Heights, Ohio, assignor to C-R-O, Inc., Menomonee Falls, Wis.

Filed May 15, 1979, Ser. No. 39,216
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—124.34 **8 Claims**



1. Apparatus for affecting a weld seam in a narrow gap formed by opposing walls of the members to be joined, comprising:

(a) a torch body having guide means for a filler wire,

(b) a generally vertical probe shaft mounted to said body,

(c) an angular probe connected to the lower end of said probed shaft and adapted for contact with the walls of the gap,

(d) biasing means connected to the upper end portion of said probe shaft to rotate the latter so that said probe normally engages a wall of the gap during welding,

(e) and selectively actuatable means connected to said probe shaft for rotating the latter and said probe against the force of said biasing means.

4,289,951

POWER FACTOR MONITORING AND CONTROL SYSTEM FOR RESISTANCE WELDING WITH LINE DISTURBANCE IMMUNITY

Dennis J. Jurek, Grafton, Wis., assignor to Square D Company, Palatine, Ill.

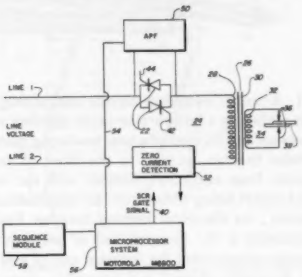
Filed Feb. 16, 1979, Ser. No. 12,926
Int. Cl.³ B23K *11/24*
U.S. Cl. 219—110 **10 Claims**

4. A power factor monitoring and control system for controlling the quality of welds in resistance welding with line disturbance immunity, including a welding transformer having primary and secondary circuits, a line voltage applied to the primary circuit and a load circuit in the secondary circuit, the improvement comprising:

means responsive to the initiation and termination of current conduction of each half cycle in a weld for measuring the differences between the current conduction times of these half cycles in the weld due to the change in power factor of the welding transformer circuits during the weld;

means for analyzing measured differences to approximate the time derivative of the conduction function which in turn is an approximation of the second derivative of the resistance function of the weld;

means for converting the conduction time function back to a numerical representation of the resistance function in the weld;



means for deriving from the numerical representation of the resistance function, a measure of the sufficiency of energy supplied to a weld;

means for summing and averaging the numerical results over a preselected number of welds to form a control signal; and

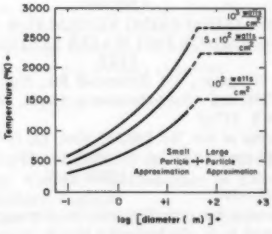
means for applying the control signal resulting from the averaging of the preselected number of welds to adjust the amount of energy delivered to the weld for the next group of welds to be averaged.

4,289,952

PROCESS FOR CONTROLLING POWDER SIZE WITH OPTICAL ENERGY

John S. Haggerty, Lincoln, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 12, 1979, Ser. No. 102,608
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 L **6 Claims**

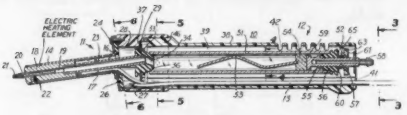


1. The process for producing a metal or ceramic powder having a narrow size distribution which comprises forming a dilute mixture of a metal or ceramic powder in a gas and passing said mixture through a collimated beam of intense light which coupled with the larger particles in said mixture to vaporize a portion of said larger particles until said larger particles have a diameter that approximates a minimum wavelength of said beam, and recovering the particles which have passed through said beam.

4,289,953
ELECTRICALLY HEATED SOLDER EXTRACTOR

William E. Scheu, Jr., 22 Sedgemere Rd., Center Morchies, N.Y. 11934

Filed Feb. 9, 1979, Ser. No. 10,639
Int. Cl.[3] B23K 3/00; H05B 1/00
U.S. Cl. 219—230 8 Claims



1. A solder extractor device comprising: a working front unit including a hollow rear cowl member with front and rear openings and formed of a heat insulating material, an elongated tubular bracket secured to the front of and projecting forwardly from said cowl member with the longitudinal axis of the bracket being oblique to the longitudinal axis of the cowl member, an electrical heating member having an axial bore positioned in the forward end of said bracket, a tubular tip member telescoping the forward end of said bore and projecting forwardly thereof and separably secured to said heating member, a conveyor tube extending rearwardly from said heating member and communicating with said bore and a tubular first seal member engaging the rear end of said conveyor tube and located within said cowl; a rear unit projecting rearwardly from said cowl member and separably secured thereto and including an elongated tubular outer handle member formed of a heat insulating material and being coaxial with said cowl member, said outer handle member being detachably secured to the rear of said cowl member, a tubular receiver disposed in said handle member and having an open front end releasably engaging said first seal member and a rear open end, and a closure member engaging said receiver member rear open end and having a passageway therethrough communicating with the rear of the receiver and a conduit coupling communicating with said passageway; and an electric power line cable freely slidably extending into the rear end of the handle member and through a longitudinal passageway in the rear unit into the front unit and being fixedly connected to said heating member, said rear unit, when said handle member is detached from said cowl member, being rearwardly slidable on said power cable to permit the separation of said front and rear units.

4,289,954
ENERGY CONSERVING SYSTEM FOR USE WITH HEATING AND/OR HOT WATER SYSTEMS AND THE LIKE

R. Joseph Brognano, 421 Briarwood Rd., North Massapequa, N.Y. 11758, and Albert Buonasera, 134 N. Boylan La., Blue Point, N.Y. 11715

Continuation of Ser. No. 840,985, Oct. 11, 1977, abandoned. This application Jul. 17, 1980, Ser. No. 169,769
Int. Cl.[3] H05B 1/02
U.S. Cl. 219—307 9 Claims

1. Apparatus for providing electrical energy at low consumption and high efficiency for use in heating and/or hot water systems, comprising:

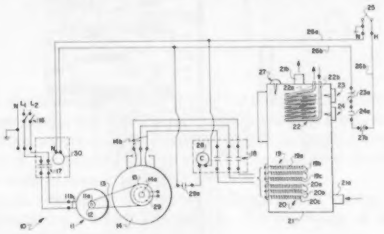
single phase motor means powered by an independent single phase a.c. source for driving its output shaft;

multiphase electrical generator means having mechanical input means;

mechanical means for coupling the output shaft of said motor means to the mechanical input means of said multiphase generator means for generating multiphase output power at the electrical outputs of said multiphase electrical generator means, wherein the electrical outputs of said multiphase electrical generator means are electrically isolated from said independent single phase a.c. source;

multiphase load means for converting electrical energy into heat for heating a fluid, said load means being electrically isolated from said single phase a.c. source and having ratings matching the output power ratings and operating frequency of said multiphase electrical generator means wherein the electrical isolation of said multiphase electrical generator means and said single phase source permits the selection of an electrical generator having an operating frequency which is different from the operating frequency of the single phase a.c. source to optimize the match between the multiphase electrical generator means and the multiphase load means regardless of the operating frequency of the single phase a.c. source;

first switch means for normally maintaining said multiphase load means electrically disconnected from the electrical outputs of said multiphase electrical generator means;



said switch means being responsive to said multiphase electrical generator means reaching a predetermined operating condition for electrically connecting said multiphase load means to said multiphase electrical generator means thereby enabling said single phase motor means and said multiphase electrical generator means to reach optimum operating conditions at a more rapid rate;

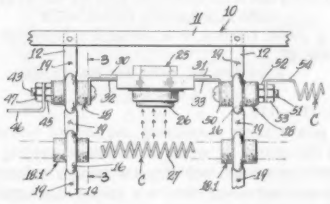
thermostat means for sensing the temperature level of the fluid being heated; and

second switch means responsive to said thermostat means for electrically disconnecting said motor means from said a.c. soruce when the fluid being heated reaches a predetermined level and for electrically reconnecting said motor means to said a.c. source when the temperature level in the fluid being heated drops below said predetermined level.

4,289,955
ELECTRIC HEATING ASSEMBLIES WITH A MOUNTED THERMOSTATIC SWITCH

Wayne R. Seeley, Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 5, 1979, Ser. No. 91,389
Int. Cl.[3] H05B 3/06
U.S. Cl. 219—532 7 Claims



1. An electric heating assembly, comprising a supporting frame including a pair of arms held in spaced-apart relation, a heating coil having a reach extending crosswise of said arms, a thermostatic switch mounted between said arms and having a

heat sensor portion directed toward said coil reach so as to be affected by heat issuing therefrom and adapted to interrupt electrical current to said heating coil when a predetermined high temperature has been reached, the improvement comprising:

means preventing improper installation or replacement of said thermostatic switch and insuring that said heat sensor portion is always directed toward said coil reach, said means comprising,

an insulating bushing carried by one of said arms, said bushing and said arm having interfitting parts to hold said bushing against substantial rotation about its axis and in a preselected relation with respect to said one arm,

means between said thermostatic switch and said bushing, interfitting in predetermined manner to hold said thermostatic switch in position with its heat sensor portion directed toward said coil reach, and

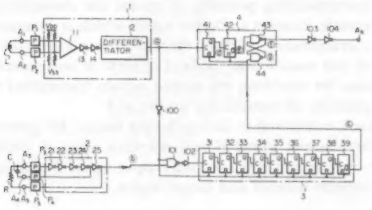
a second insulating bushing carried by the other arm, said thermostatic switch having a pair of terminals respectively supported by said bushings.

4,289,956

TIME-PERIOD COMPARING DEVICE

Fumitaka Asami, Kunitachi, Japan, assignor to Fujitsu Limited, Japan

Filed May 18, 1979, Ser. No. 40,410
Claims priority, application Japan, May 23, 1978, 53-61279
Int. Cl.[3] H03K *21/30*; G06M *3/02*
U.S. Cl. 235—92 T **23 Claims**



1. A time-period comparing device, for comparing the time-period of an input signal with the time-period of a reference signal, comprising:

an input circuit, having an input terminal, for receiving the input signal;

an oscillator for providing a pulse signal;

a reference period comparing means, operatively connected to said input circuit and said oscillator, for receiving the input signal and said pulse signal and for generating the reference signal which is a rectangular signal or a definite level signal in dependence upon the frequency of the input signal;

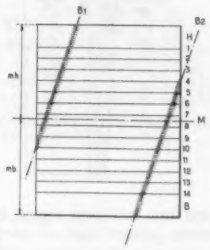
a time-period comparator, operatively connected to said input circuit and said reference period comparing means, for continuously comparing the input signal with the reference signal and for producing two different signals, each of which is at a direct current level, in dependence upon the relationship between the time-period of the input signal and the time-period of the reference signal.

4,289,957

READING STROKE CODES

Jean Neyroud, Saint Martin d'Heres, and Francois Ollivier, Meylan, both of France, assignors to La Telemecanique Electrique, France

Filed Apr. 17, 1979, Ser. No. 30,796
Claims priority, application France, Apr. 19, 1978, 78 11471
Int. Cl.[3] G06K *7/10, 7/14, 9/00*
U.S. Cl. 235—462 **5 Claims**



1. In a process of reading, from a movable support having lower and upper margins and a data field, of data and security characters recorded in said field and said margins respectively and coded in accordance with a bar code, of the kind comprising the steps of:

(i) using a scanning light beam to carry out first and second sweeps onto the support in movement, said sweeps having a constant direction, the first sweep being carried out from top to bottom of the support and the second sweep being carried out from bottom to top

(ii) detecting the light reflected by said support to provide a signal comprising data characters and lower and upper security characters corresponding to said data field and said lower and upper margins respectively and

(iii) decoding these data and security characters by comparison of the relative widths of the bars and the intervals between the bars, the improvement that

(a) the process comprises the step of proceeding to the collecting of those portions of the said signal which originate in the course of pairs of successive sweeps and to the selection of those of the said signal portions which comprise at least one upper or lower security character and a number of data characters at least equal to half of the total number of data characters in the said data field, and

(b) the process further comprises the step of associating for the purpose of reconstitution and decoding of the complete data, couples of two selected successive signal portions of which one comprises an upper security character and the other a lower security character.

4,289,958

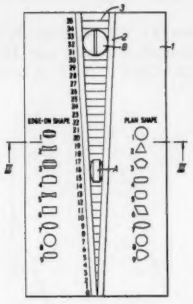
SYSTEM FOR IDENTIFYING SOLID DOSAGE UNITS

Stephen Thomas, Cardiff, Wales, assignor to Edwin Burgess Limited, Aylesbury, England

Filed Feb. 7, 1980, Ser. No. 119,597
Int. Cl.[3] G06K *19/06*
U.S. Cl. 235—489 **9 Claims**

1. An identification system for a solid dosage unit, comprising a member defining a substantially straight-sided channel which tapers from one end towards the other to define a V-shaped channel in which a dosage unit can be placed, markings being associated with the channel for indicating a dimension parameter of the unit when placed in the channel, a colour region having a plurality of coloured areas for indicating a colour parameter of the dosage unit, a shape region bearing a series of shape parameters, and an information storage and

retrieval system operative, when fed with parameters of the dosage unit obtained from said V-shaped channel, from said



colour region and from said shape region, to provide an identification of the unit.

4,289,959

APPARATUS FOR DETECTING THE IN-FOCUSING CONDITIONS

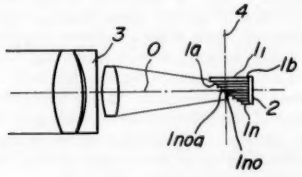
Shuichi Takayama; Kosaku Tsuboshima; Yoshio Nakajima, all of Hachioji; Teruo Iwasawa, Mitaka, and Masafumi Yamazaki, Okaya, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Filed Nov. 9, 1979, Ser. No. 92,686

Claims priority, application Japan, Nov. 15, 1978, 53-141288

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—201 **7 Claims**



1. An apparatus for detecting in-focusing conditions of an optical system comprising: a plurality of optical fibers of different lengths which are closely arranged to each other and have light inlet ends arranged side by side along a given line and located at different levels when viewed in a direction of an optical axis of the optical system and light outlet ends located on a same plane, the inlet end of a centrally arranged optical fiber being situated on a predetermined focal plane of the optical system; a like number of charge transfer elements arranged at the respective outlet ends of the optical fibers to receive light rays emerging from respective picture elements and transmitted through the respective optical fibers and to produce illuminance signals; and means for receiving the illuminance signals from the charge transfer elements and processing the received illuminance signals in accordance with a predetermined function to produce a signal which represents a focusing condition of the optical system.

4,289,960

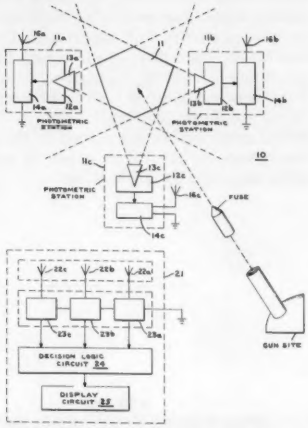
ARTILLERY TRAINING ROUNDS TARGET SCORING SYSTEM

Chester L. Smith, Lake Hopatcong, and William Donnally, Boonton Twp., Morris County, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 3, 1979, Ser. No. 54,755

Int. Cl.³ G01P *3/68*

U.S. Cl. 250—222 R **14 Claims**



1. Apparatus for registering and scoring the impact of an incoming munition, said munition being of a type that generates a burst of radiation upon impact, which comprises:

a plurality of radiation detectors, each having a fixed field of view in the horizontal plane, the logical union of said fields of view defining a target region in the horizontal plane;

a corresponding plurality of means for transmitting to a remote location an output signal which is generated by a corresponding radiation detector in response to the impact of said munition in the field of view of said detector;

means for receiving the output signals transmitted by said plurality of transmitting means; and

means, connected to said receiving means, for generating a first output signal if said munition impacts within said target region and a second output signal if said munition impacts without said target region.

4,289,961

APPARATUS FOR SCANNING THE MARKINGS ON BOTTLE NECKS

Wilfried Kurth, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg-Werke, Postfach, Fed. Rep. of Germany

Filed Jan. 11, 1979, Ser. No. 966,992

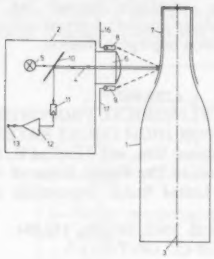
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1977, 2754319

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—223 B **5 Claims**

1. In an apparatus for scanning the markings on foils on the necks of the bottles in a bottle labeling machine having a photoelectric scanner including a light source and a lens for illuminating the foil on the bottle neck, a beam splitter in the path of the light, a photosensitive receiver and a first amplifier having the input thereof receptive of the receiver output, the improvement wherein the photosensitive receiver comprises a pair of

photoelectric elements respectively provided outside of the lens and wherein the first amplifier comprises an integrating



amplifier operatively connected to each output of the pair of photoelectric elements.

4,289,962

OPTOELECTRONIC SYNCHRO GENERATOR

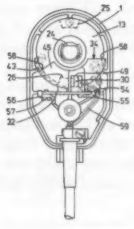
Herbert Palloch, Schwetzingens, and Hans Erndt, Wiesloch, both of Fed. Rep. of Germany, assignors to Frankl & Kirchner GmbH & Co. KG, Schwetzingen, Fed. Rep. of Germany

Filed Aug. 22, 1979, Ser. No. 68,794

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1978, 2837743

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 SE **11 Claims**



1. An optoelectronic synchro generator comprising at least one photoelectric circuit element, each including a light source and an associated receiver; a rotatable shaft; means mounted on the shaft both for normal rotation therewith and for selective adjusting rotation with respect thereto for defining at least one optically effective surface spaced from the axis of rotation of the shaft by which light coming from the light source impinges on the receiver when said surface is in a predetermined position during the rotation of said shaft; a removable cover which covers the shaft and the photoelectric circuit element; at least one shielding means disposed at least in front of the receiver, but behind the path of the means defining the optically effective surface when viewed from the receiver, for permitting light from the source to impinge on the receiver when the surface is in the predetermined position and for preventing the impingement of stray light on the receiver when the cover is removed.

4,289,963

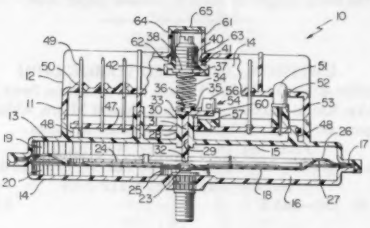
CONTROL DEVICE AND METHOD OF MAKING THE SAME

Charles J. Everett, Clinton, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sep. 17, 1979, Ser. No. 76,407

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 P **28 Claims**



1. In a control device having a housing means provided with an actuator chamber separated from a pressure differential chamber by wall means having opening means therethrough receiving an axially movable actuator pin that transmits axial movement of a movable part in said pressure differential chamber to said actuator chamber, said actuator pin being separate from and engageable with said movable part, the improvement comprising optical switch means in said actuator chamber, said actuator pin having interrupter means for actuating said optical switch means when said movable part axially moves said actuator pin to a certain axial position relative to said housing means, said actuator pin having orientation means, said opening means having orientation means cooperating with said orientation means of said actuator pin to maintain said interrupter means of said actuator pin in proper rotational alignment with said optical switch means.

4,289,964

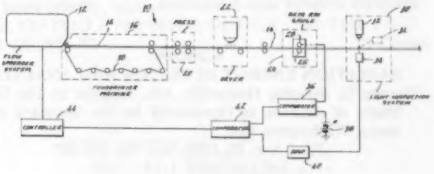
RADIATION INSPECTION SYSTEM FOR A MATERIAL MAKING APPARATUS AND METHOD USING A BETA RAY GAUGE

Cole H. Baker, Westport, Conn., assignor to Intec Corporation, Trumbull, Conn.

Filed Jan. 24, 1980, Ser. No. 114,901

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—308 **5 Claims**



1. A method of controlling the production of paper products using a beta ray gauge in conjunction with a light inspection system for inspecting a moving web of formed paper material comprising the steps of:

dispensing paper stock onto a wire support for forming a continuous paper web,

sampling the basis weight of the continuous paper web so formed by passing said web through a beta ray gauge which generates a first signal based on the weight of the paper web where measured by the beta ray gauge,

comparing the first signal from the beta ray gauge with a predetermined reference signal preset for the weight desired to produce a difference signal,

continuously inspecting the entire paper web with a light

inspection system by applying a light source across the paper web and detecting light emanating therefrom to provide a second signal based on the light transmitting or reflecting characteristics of said paper web,

comparing said difference and second signals and deriving a control signal therefrom, and

regulating the dispensing of paper stock forming said continuous paper web using said control signal for controlling the basis weight of said continuous paper web.

4,289,965

EMISSION COMPUTED TOMOGRAPH

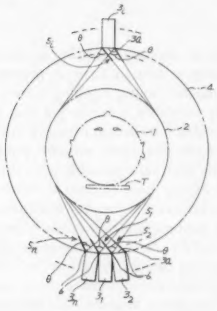
Kenichiro Koga; Yoshiharu Hirose, both of Kyoto; Iwao Kanno, Akita; Kazuo Uemura, Akita, and Shuichi Miura, Akita, all of Japan, assignors to Shimadzu Corporation, Japan

Filed Jan. 16, 1980, Ser. No. 112,637

Claims priority, application Japan, Jan. 23, 1979, 54-8120[U]

Int. Cl.³ G01T *1/20;* G21F *5/04*

U.S. Cl. 250—363 S **6 Claims**



1. An emission computed tomograph comprising: means for supporting an object to be examined at a predetermined position, said object having taken therein a radionuclide that emits radiation; a plurality of radiation detectors so arranged as to surround said predetermined position; a plurality of collimator means each for use with a different kind of radionuclides and each so arranged as to surround said position; means for supporting said plurality of collimator means in axial alignment; means for causing said supporting means to be axially displaced relative to said detectors so that each of said collimator means can alternatively be brought into radial alignment with and operative relation to said detectors.

4,289,966

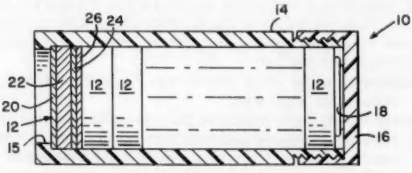
RADIATION ENERGY DETECTOR AND ANALYZER

Thomas G. Roberts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1980, Ser. No. 138,967

Int. Cl.³ G01T *1/18, 1/185*

U.S. Cl. 250—378 **10 Claims**



1. A radiation detector comprising: a plurality of batteries arranged coaxially in respective parallel planes forming a stack, each of said batteries being disposed to exhibit a reduction in electrical voltage in response to passage of radiation therethrough, said plurality of batteries being of sufficient stack depth to prevent all radiation impinging coaxially thereon from passing completely through the stack and thereby providing a voltage gradient decrease across the stack indicative of any radiation impinging thereon.

4,289,967

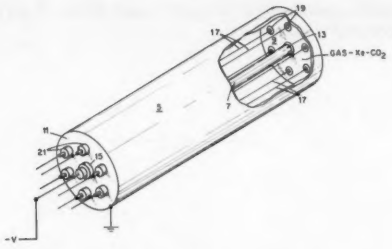
MULTIANODE CYLINDRICAL PROPORTIONAL COUNTER FOR HIGH COUNT RATES

James A. Hanson, Madison, Wis., and Manfred K. Kopp, Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 23, 1980, Ser. No. 152,954

Int. Cl.³ G01T *1/18*

U.S. Cl. 250—385 **10 Claims**



1. A proportional counter tube for detecting ionizing radiation comprizing:

a closed cylindrical housing forming an outer cathode electrode;

a cylindrical inner cathode electrode disposed coaxially within said housing and spaced from the cylinder wall of said housing to form a detection volume between said inner and outer cathodes,

a plurality of uniformly spaced-apart anode electrodes disposed intermediate said inner and outer cathodes and parallel to the longitudinal axis of said cathodes;

an ionizable gas filling said detection volume within said housing; and

means for applying bias voltages between said outer cathodes and said plurality of anodes and said inner cathode and said plurality of anodes so that a uniform electrostatic field is provided within said detection volume thereby minimizing the electron collection time at said anodes following ionizing events within said gas filling said detection volume.

4,289,968

RADIOGRAPHY

Christopher A. G. LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 543,338, Jan. 23, 1975. This application Jul. 11, 1977, Ser. No. 814,631

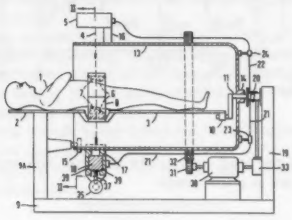
The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

Int. Cl.³ G01N *21/00*

U.S. Cl. 250—445 T **2 Claims**

1. Radiographic apparatus for examining at least one slice disposed cross-sectionally of a patient's body, comprising means defining a patient position including a region in which said at least one slice can be disposed, a source of a fan-shaped spread of penetrating radiation, support means supporting said source so that said radiation projects through said region along a plurality of beams which are distributed across said spread at respective angular orientations therein so that they diverge from one another with increasing distance from said source,

means for moving said source angularly around the patient position to project said beams of radiation through said region from a plurality of locations distributed angularly around said patient position, detecting means, including a plurality of detector devices, disposed to detect said beams of radiation after



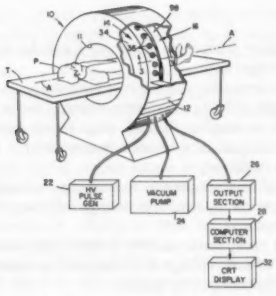
they have traversed said region, and means causing relative movement between said spread of radiation and said detector devices whereby each beam of radiation is detected by a respective detector device at one stage of said angular movement of said source and by a different respective detector device at another stage of said angular movement.

4,289,969

RADIATION IMAGING APPARATUS

Gerald Cooperstein, Rockville, Md.; Richard C. Lanza, and A. Robert Sohval, both of Cambridge, Mass., assignors to Butler Greenwich Inc., Greenwich, Conn.

Filed Jul. 10, 1978, Ser. No. 922,982
Int. Cl.³ G03B *41/16*
U.S. Cl. 250—445 T **19 Claims**



1. In a computerized tomographic scanner:

A. a fixed array of cold cathode diodes each said diode being characterized by an impedance in excess of about 100 ohms;

B. a fixed array of radiation detectors juxtaposed to the diode array;

C. means for applying greater than 100 ns duration and less than 200 kv voltage pulses sequentially to the diodes in the array so as to cause said diodes to emit successive substantially constant amplitude X-ray pulses, said radiation being detected by the detectors in the detector array, and

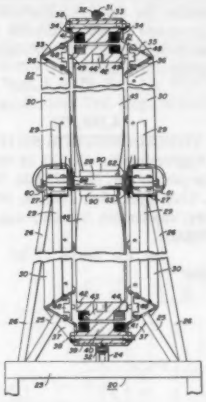
D. means responsive to the output signals from said detectors for producing a reconstruction image of a selected body slice illuminated by radiation from the diode array.

4,289,970

WIND POWERED ELECTRICAL GENERATOR

David D. Deibert, 1524 Grasshopper Rd., Huntingdon Valley, Pa. 19006

Filed Nov. 22, 1978, Ser. No. 962,957
Int. Cl.³ F03D *9/00*
U.S. Cl. 290—44 **23 Claims**



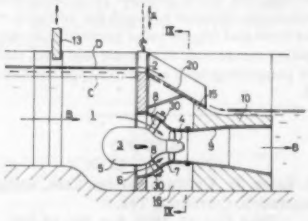
1. A wind powered alternating current electrical generator of the type having a rotatable wind wheel generator rotor consisting of a circular rim carrying one of the armature or field structures and a plurality of angularly spaced radially extending windvanes connecting the rim to a rotatable central shaft, a stator carrying the other of the armature or field structures and past which the windwheel rotor rim rotates, and a supporting structure for the windwheel rotor and the stator, characterized in that the stator extends concentrically closely peripherally completely around the rotor substantially co-planar therewith and radially outward therefrom.

4,289,971

ELECTRIC POWER GENERATION EQUIPMENT INCORPORATING BULB TURBINE-GENERATOR

Tsuneo Ueda, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 25, 1979, Ser. No. 33,083
Claims priority, application Japan, Apr. 18, 1979, 54/47700
Int. Cl.³ F01D *15/10*; F02C *6/00*; H02K *7/18*; F16D *31/02*
U.S. Cl. 290—52 **9 Claims**



1. A movable hydroelectric power generation system in a water channel comprising: a bulb turbine generator comprising an electric power generator housed in a bulb shape inner casing and a turbine runner connected to a main shaft of said electric power generator; an outer casing having annular upstream and downstream ends, disposed outside said inner casing and positioning said inner casing by stay vanes so as to position said

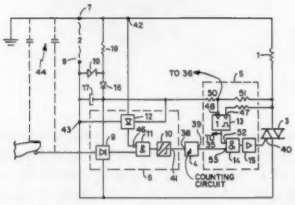
generator partially within said outer casing and partially outside said outer casing; a draft tube coupled to said annular downstream end of said outer casing; and a liftable gate positioned to dam up said water channel, said gate being vertically movable, said gate having an annular opening, and said annular upstream end of said outer casing being fixedly secured to said annular opening of said gate, whereby said generator is disposed on both the upstream and downstream sides of said gate, to thereby minimize the upstream and downstream extent of said movable generator system whereby the vertical movement of said generator system is enhanced by the minimal extent of said generator system.

4,289,972

TOUCH CONTROL SWITCH

Lars A. Wern, Upplandsgatan 65, 113 28 Stockholm, Sweden

Continuation-in-part of Ser. No. 885,806, Mar. 13, 1978, Pat. No. 4,210,822. This application Jan. 24, 1979, Ser. No. 6,251
Claims priority, application Sweden, Aug. 5, 1977, 7708952; Aug. 4, 1978, 7800026
Int. Cl.³ H03K *17/68*
U.S. Cl. 307—116 **14 Claims**



1. A touch control switch connectable between a lamp type load and an AC power supply in an AC type of lighting installation for controlling said load in response to touch, said touch control switch comprising gating means trigger pulse generating means operatively connected to said gating means for changing the state thereof, pulse counting means operatively connected to the input of said trigger pulse generating means for controlling the state of said gating means in accordance with the output of said pulse counting means, touch sensitive impedance means, and control pulse shaping means having its input operatively connected to said power supply through said touch sensitive impedance means and its output operatively connected to the input of said pulse counting means, said trigger pulse generating means having a leading edge triggering input and a trailing edge triggering input with said triggering inputs being operatively connected in parallel to said power supply, said touch sensitive impedance means varying said impedance in response to touch for initiating trigger pulse generation from said trigger pulse generating means for changing said gating means state to activate said load, said load being capable of comprising both a reactive type load and a resistive type load.

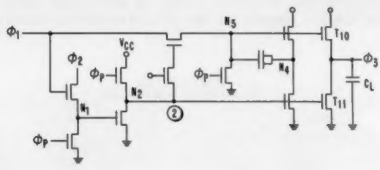
4,289,973

AND-GATE CLOCK

Sargent S. Eaton, Jr., Colorado Springs, Colo., assignor to Mostek Corporation, Carrollton, Tex.

Filed Aug. 13, 1979, Ser. No. 66,147
Int. Cl.³ H03K *19/08, 19/20*
U.S. Cl. 307—448 **9 Claims**

1. An AND-gate clock comprising:
an input stage adapted to receive a first and a second input signal for providing a plurality of interstage signals in response to the first and second input signals;
an output stage for driving a load having a large capacitance; and
an isolation stage means coupled between the input stage and the output stage for receiving the plurality of interstage signals and for enabling the output stage to provide a true



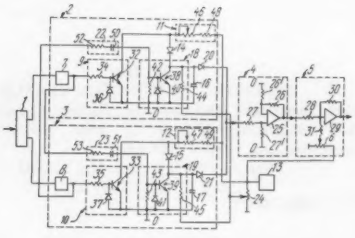
level to the load only when the first and second input signals are at a true level.

4,289,974

VOLTAGE FREQUENCY METER OF SYNCHRONOUS ELECTRICAL MACHINE

Vladimir M. Katunin, ulitsa Shefskaya, 30, kv. 8, and Vladimir G. Nakrokhin, ulitsa Baumana, 32a, kv. 9, both of Sverdlovsk, U.S.S.R.

Filed Sep. 24, 1979, Ser. No. 78,662
Claims priority, application U.S.S.R., Jan. 18, 1979, 2715253
Int. Cl.³ H03K *5/00, 5/22*
U.S. Cl. 307—527 **1 Claim**



1. A voltage frequency meter of a synchronous electrical machine, comprising:
a voltage converter having two outputs;
a first input voltage measuring channel and a second input voltage measuring channel, their inputs being connected to said outputs of said voltage converter;
a voltage follower;
outputs of said frequency measuring channels being connected to an input of the voltage follower;
a power source;
a voltage comparator having a first input connected to an output of said voltage follower, and a second input connected to said power source;
an adjusting resistor having a movable contact;
each of said input voltage frequency measuring channels containing:
a zero-crossing detector intended to convert sinusoidal voltage to square-wave voltage;
two transistor switches, the first having its input connected to an output of said zero-crossing detector;
a differentiating circuit connected to an input of said second transistor switch;
a charging resistor;
an isolating diode;
a decoupling diode;
a storage capacitor;
an output of the first transistor switch being connected to said power source via said charging resistor and via said isolating diode to the output of said second transistor switch and to said storage capacitor;

said storage capacitor being connected via said decoupling diode to the input of said voltage follower;

the input of said second transistor switch of said first frequency measuring channel being connected via said differentiating circuit of said first channel to the output of said zero-crossing detector of said second frequency measuring channel;

the input of said second transistor switch of said second frequency measuring channel being connected via said differentiating circuit of that frequency measuring channel to the output of said zero-crossing detector of said first frequency measuring channel;

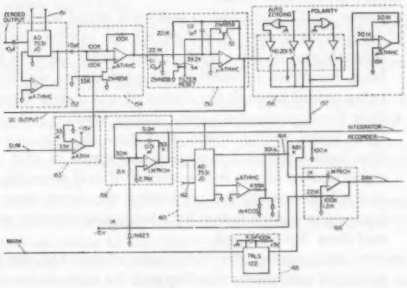
said power source being connected to said adjusting resistor whereof the movable contact is connected to the output of said second transistor switch of each of said frequency measuring channels.

4,289,975

DISSIPATING ELECTRICAL CHARGE

Norman F. Rolfe, Carlisle, Mass., assignor to Waters Associates, Inc., Milford, Mass.

Filed Jul. 20, 1979, Ser. No. 59,292
Int. Cl.³ H03K *17/04, 17/12*
U.S. Cl. 307—246 **3 Claims**



1. In circuitry of the type including analog circuit means for producing an analog output in response to an input and digital circuit means for sampling said output, said analog circuit means including a charge storage element that can become charged in response to said input, the improvement comprising charge dissipation means for dissipating the charge built up in said charge storage element during an interval prior to sampling of said output by said digital circuit means,

wherein said digital circuit means and analog circuit means are connected in a loop and said digital means includes means for providing said input to said analog circuit and for periodically changing said input in response to changes in said sampled output,

wherein said digital circuit means includes means for changing said input so that said output approaches a desired value,

wherein said digital circuit means includes comparator means for measuring whether said output is above or below said desired value and includes means for adjusting said input to said analog circuit based on the output of said comparator,

wherein said analog circuit means includes a low-pass filter which includes one or more capacitors which form said charge storage element, the response of said filter being characterized by a time constant, and

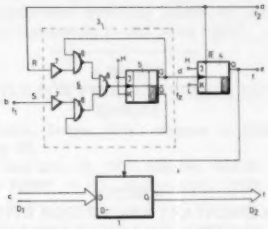
wherein said digital circuit means includes means for varying said input so that at two successive sampling times said analog output can change from a first value greater than said desired value to a second value less than said desired value, the amount by which said second value is less than said desired value being 100 or more times smaller than the amount by which said first value exceeds said desired value, whereby the time required, without dissipation of the charge stored in said capacitors, for said output to change from being above to being below said desired value, and thereby allow said comparator output to change, is of the order of 5 or more said time constants.

4,289,976

CIRCUIT ARRANGEMENT FOR THE TRANSMISSION OF DIGITAL DATA

Hans-Peter Maly, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 5, 1979, Ser. No. 91,524
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848803
Int. Cl.³ H03K *5/13*
U.S. Cl. 307—247 R **4 Claims**



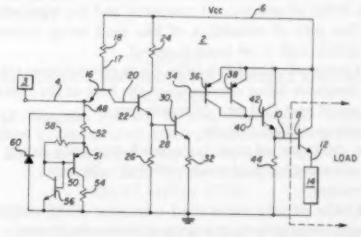
1. An interface circuit for the transmission of digital data between digital data handling systems operating with different clock frequencies, the circuit comprising an edge-controlled R-S flip-flop of which the S input is supplied with a first clock signal and the R input is supplied with a second clock signal, a J-K flip-flop of which the J input is maintained at a high logic level and the K input is maintained at a low logic level, the J-K flip-flop having a clock input connected to the output of the R-S flip-flop and a reset input supplied with the second clock signal, and at least one D flip-flop having a clock input connected to the output of the J-K flip-flop and whose D input is arranged to receive digital data at the frequency of the first clock signal, whereby at the output of the D flip-flop digital data is produced in synchronism with the second clock signal.

4,289,977

CMOS COMPATIBLE BIPOLAR DRIVE CIRCUIT WITH PROTECTIVE CLAMP

Vernon B. Powers, and Harry I. Crawford, both of St. Petersburg, Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jun. 12, 1978, Ser. No. 914,863
Int. Cl.³ H03K *3/01, 17/16, 5/02*
U.S. Cl. 307—270 **8 Claims**



1. A drive circuit for driving an electrical load in response to an input drive signal from a source thereof, comprising:

first circuit means having an input and an output for generat-

ing a signal at said first circuit means output in response to the input drive signal at said first circuit means input;

said circuit means having an input and an output for generating a logic level signal at said second circuit means output in response to said first circuit means generated signal at said second circuit means input, said second circuit means output being connected for driving the load;

a first resistor having a first terminal thereof connected to said first circuit means input;

a second resistor having a first terminal thereof connected to ground;

a first clamp transistor having the collector and emitter terminals thereof connected between the second terminals of said resistors; and

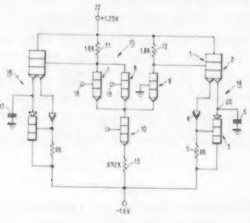
means connected to the base and collector terminals of said first clamp transistor and to ground for controlling current flow through said first clamp transistor.

4,289,978

COMPLEMENTARY TRANSISTOR INVERTING EMITTER FOLLOWER CIRCUIT

Richard R. Konian, Poughkeepsie, and James L. Walsh, Hyde Park, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 5, 1979, Ser. No. 82,255
Int. Cl.³ H03K *19/40, 19/36*
U.S. Cl. 307—270 **7 Claims**



1. A complementary emitter follower circuit comprising:

a series connected first pair of bipolar complementary transistors,

the emitters of said first pair of transistors being connected together and to an output terminal,

a series-connected second transistor and Schottky diode,

the bases of said second transistor and the transistor of said first pair of transistors of like kind being connected together and to an input terminal,

the terminal of said Schottky diode remote from said second transistor being connected to the base of the other transistor of said first pair of transistors,

a source of first voltage,

the collector of said last-named transistor being directly connected to said source of first voltage,

a resistor,

the base of said last-named transistor being connected by said resistor to said source of first voltage, and

a source of second voltage,

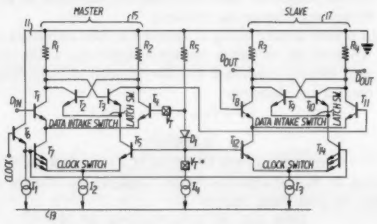
the collectors of said second transistor and of said transistor of like kind being connected to said source of second voltage.

4,289,979

TRANSISTORIZED MASTER SLAVE FLIP-FLOP HAVING THRESHOLD OFFSETS GENERATED BY CIRCUIT SIZE VARIATIONS

Harold Muller, Carlsbad, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 28, 1978, Ser. No. 937,687
Int. Cl.³ H03K *3/289*
U.S. Cl. 307—272 A **8 Claims**



1. A master slave flip-flop circuit comprising:

input signal source means;

a master flip-flop coupled to said input signal source means and having a data intake circuit for passing the input source signal to the output of said master flip-flop and a latch circuit for preventing the input source signal from being passed through the output of said master flip-flop;

a slave flip-flop coupled to said master flip-flop and to said input signal source means, said slave flip-flop having a data intake circuit for passing the signal of said input signal source means to the output of said slave flip-flop and a latch circuit for preventing the signal from said input signal source means from being passed to the output said slave flip-flop; and

means for actuating the data intake circuit and the latch circuit of said master flip-flop and the data intake circuit and the latch circuit of said slave flip-flop such that the data intake circuit of said master flip-flop and the data intake circuit of said slave flip-flop are never simultaneously actuated;

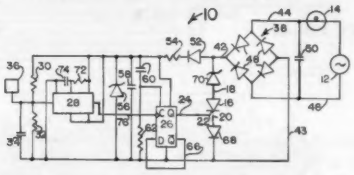
said means for actuating the data intake circuit and the latch circuit of the master flip-flop comprising: a source of clock signals; a first current source; a first multi-emitter bipolar transistor having its base coupled to said source of clock signals, its emitters coupled to said first current source and its collector coupled to said data intake circuit of said master flip-flop; a DC voltage source having a constant output intermediate the voltage range of said clock signals; and a first bipolar transistor having its base coupled to said DC voltage source, its collector coupled to said latch circuit of said master flip-flop and its emitter coupled to said first current source whereby current from said current source is steered by said first bipolar transistor to said latch circuit of said master flip-flop when the level of said clock signal is less than said voltage level of said first DC voltage source and where said current from said first current source is steered through said first multi-emitter transistor to said data intake circuit of said master flip-flop when said voltage level of said clock signal is greater than said voltage level of said constant DC voltage source;

said means for actuating the data intake circuit and the latch circuit of said slave flip-flop comprising: a second current source; a second multi-emitter bipolar transistor having its base coupled to said source of clock signals, its collector coupled to said latch circuit and its emitters coupled to said second current source; and a second bipolar transistor having its base coupled to said DC voltage source, its collector coupled to said data intake circuit of said slave flip-flop and its emitter coupled to said second current source.

4,289,980
TOUCH SENSITIVE ELECTRIC SWITCH

Richard J. McLaughlin, 4203 W. 141st St., Hawthorne, Calif. 90250

Filed Jun. 22, 1979, Ser. No. 51,430
Int. Cl.³ H03K *3/26;* **G08B** *13/26*
U.S. Cl. 307—308 **7 Claims**



1. A touch sensitive electric switch for connection in circuit with an alternating current power source and a current load comprising:

semiconductor means with a trigger input lead for connecting load current responsive to signals on said trigger input lead,

electronic flip-flop means with an output connected to said trigger input lead,

electronic one shot multivibrator sensing means having an output connected to an input of said flip-flop for generating an electronic pulse to said flip-flop means in response to an actuating input thereto,

biasing means including a voltage dividing network for maintaining a steady d.c. bias to said sensing means to suppress pulse generation and including charge storage means connected to said sensing means, to at least partially filter noise,

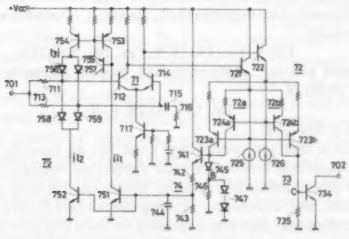
conductive touch plate means connected to said sensing means for removing said suppressing bias in response to a manual touch to said touch plate, and

rectifying means connected to said alternating current power source to supply direct current for operating said electronic flip-flop means, said electronic sensing means and said biasing means.

4,289,981
PULSIVE COMPONENT DETECTING APPARATUS

Junji Sakamoto, Oota, and Hiroyasu Kishi, Gunma, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Mar. 23, 1979, Ser. No. 23,408
Claims priority, application Japan, Jun. 21, 1978, 53-75613; Jun. 21, 1978, 53-75614; Jul. 5, 1978, 53-83277
Int. Cl.³ H03K *5/153;* **H03L** *5/00*
U.S. Cl. 307—350 **17 Claims**



1. An apparatus for detecting a pulsive component in an input signal including a pulsive component in superposition on a continuous component, comprising:

amplifying means for amplifying said input signal,

rectifying means responsive to the output of said amplifying means for rectifying the output of said amplifying means,

detecting means responsive to the output of said rectifying means for detecting at a first detecting level the output of said rectifying means for providing a control signal associated with the level of said continuous component of said input signal,

limiting means responsive to said control signal obtained from said detecting means for limiting the amplitude of said input signal being applied to said amplifying means,

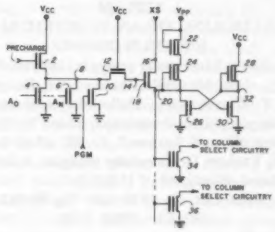
pulsive component detecting means responsive to the output of said rectifying means for detecting at a second detecting level a pulsive component in said input signal, and

level ratio setting means operatively coupled to said detecting means and said pulsive component detecting means for controlling said first and second detecting levels of said detecting means and said pulsive component detecting means, respectively, for avoiding malfunction of said pulsive component detecting means by virtue of said continuous component in said input signal.

4,289,982
APPARATUS FOR PROGRAMMING A DYNAMIC EPROM

Stephen L. Smith, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1979, Ser. No. 53,148
Int. Cl.³ H03K *19/173, 19/096;* **G11C** *7/00, 11/40*
U.S. Cl. 307—463 **12 Claims**



1. A circuit for providing a programming signal from a first source of supply voltage to row or column conductors of an electronically programmable read-only-memory, comprising:

first means associated with each of said conductors for latching each of said conductors at a voltage below that of said first source;

second means associated with each of said conductors for establishing an enabling voltage with a single precharge pulse;

first switching means coupled to said enabling voltage and responsive thereto for unlatching a selected one of said conductors; and

third means associated with each of said conductors for coupling said first source to said selected one of said conductors.

4,289,983
ENCODER FOR MONITORING BIDIRECTIONAL MOTION

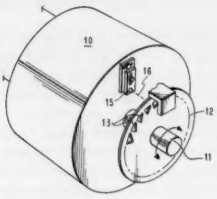
Lutz H.O. Bengnar, Wallace E. Kee, Raymond D. Mathews, and Stephen T. Olson, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,650
Int. Cl.³ H02K *37/00*
U.S. Cl. 310—49 R **23 Claims**

1. In a rotational encoder apparatus having a plurality of indicia at fixed positions with respect to each other, means for rotating said indicia about an axis and means for sensing said indicia positioned along the path of rotation of said indicia, the improvement

wherein each of a plurality of said indicia has a first edge radial to said axis and traversing said path of rotation and a second edge non-radial to said axis, traversing said path of rotation,

and



further including means for moving said sensing means so that the position of said sensing means may be adjusted with respect to said first edges which are the leading edges when said indicia are rotated in one direction and to said second edges which are the leading edges when said indicia are rotated in the opposite direction.

4,289,984

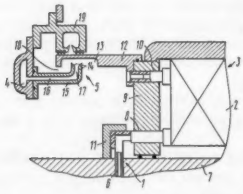
LIQUID COOLING OF AN ELECTRIC MACHINE ROTOR WINDING

Jury V. Aroshidze, Moskovsky prospekt, 199, kv. 37; Ibragim A. Kadi-Ogly, ulitsa Marshala Zhukova, 64, Korpus 1, kv. 180; Vladimir P. Chernyavsky, Pulkovskaya ulitsa, 17 kv. 185; Aron B. Shapiro, ulitsa Basseinaya, 53 kv. 71; Boris I. Fomin, Petrovskaya ulitsa, 4, korpus 2, kv. 50, all of Leningrad, and Anatoly F. Yankov, Detskoselsky prospekt, 1, kv. 63, Pushkin Leningradskoi oblasti, all of U.S.S.R.

Filed Oct. 18, 1979, Ser. No. 86,063

Int. Cl.[3] H02K *9/00*

U.S. Cl. 310—54 **4 Claims**



1. A device for collecting discharged cooling liquid from axial outlet passages of a rotor winding of an electric machine, having means for supplying a cooling liquid to the rotor winding, said supply means being connected by axial inlet passages with said winding, and means for discharging the cooling liquid into a drain cavity, said discharge means being in communication with axial outlet passages of said winding, said discharge means comprising an outer cylindrical member having an annular recess on the inner surface thereof attached to the rotor and mounted concentrically with the rotor shaft, a stationary inner cylindrical member mounted in concentric relation with the rotor shaft, said inner cylindrical member having on its outer surface an annular projection engaging the annular recess of said outer cylindrical member and having at least one inner annular cavity open at the outer diameter of the annular projection, and a drain cavity provided in said inner cylindrical member and communicating with the inner annular cavity.

4,289,985

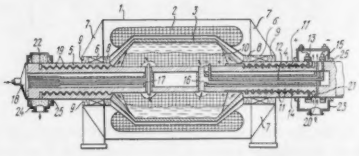
ELECTRICAL MACHINE WITH CRYOGENIC COOLING

Jury S. Popov, ulitsa Bariernaya, 16, kv. 14, Novosibirsk; Jury V. Skachkov, Nevsky prospekt, 125, kv. 13, Leningrad; Iosif F. Filippov, ulitsa Pulkovskogo, 17, kv. 39, Leningrad, and Gary M. Khutoretsky, ulitsa Altaiskaya, 20, kv. 5, Leningrad, all of U.S.S.R.

Filed Dec. 22, 1978, Ser. No. 972,397

Int. Cl.[3] H02K *1/32*

U.S. Cl. 310—61 **9 Claims**



1. An electrical machine with cryogenic cooling, comprising:

a stator having a winding fixed in an internal cavity;

a hollow rotor fixed in said stator and including a superconducting winding in an internal cavity, a hollow shaft of said rotor having first and second end parts, each end part having at least one cooling duct provided with inlet end and outlet end members, said first end part having an inlet means and a passage, said second end part having a passage with an inlet end member connected to said internal cavity of said rotor and an outlet end member, and each end part having coolant collecting chambers;

a coolant for cooling said rotor introduced into said cavity of said rotor via said inlet means and said passage of said first end part;

at least two supply leads having first ends rigidly attached to said superconducting winding, a first supply lead being disposed in said cooling ducts of said second end part and a second supply lead being disposed in said passage of said second end part;

at least two current-collecting means disposed in respective coolant collecting chambers and connected to second ends of respective supply leads; and

exhausting means mounted in respective coolant collecting chambers and coupled to said outlet end members of said cooling ducts and of said passage of said second end part to withdraw said coolant from said internal cavity of said rotor.

4,289,986

COOLANT CONNECTING HEAD FOR AN ELECTRIC MACHINE WITH A SUPERCONDUCTING ROTOR WINDING

Dieter Kullmann, Langenzenn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,219

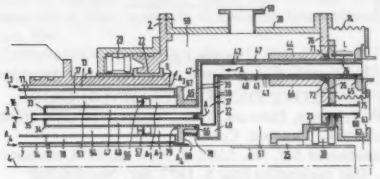
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856128

Int. Cl.[3] H02K *9/00*

U.S. Cl. 310—61 **9 Claims**

1. In a coolant connecting head for an electric machine, which machine contains a rotor supported rotatably about an axis a superconducting winding which can be deep cooled by a coolant, and a device for feeding the coolant from a nonrotating coolant line part into a rotating coolant line part connected to the rotor, and containing at least one sealing device which seals off an interspace formed between these line parts and which, in the operating state of the machine, allows a predetermined leakage rate which depends on the pressure difference prevailing there, the improvement comprising at least one further sealing device with an adjustable seal gap formed

between the sealing surfaces thereof for sealing the interspace, whereby said seal gap may be adjusted according to the operat-



ing condition of the electric machine so as to be fully effective during the cooling down phase and adjusted to be no longer fully effective after the machine has reached its nominal speed.

4,289,987

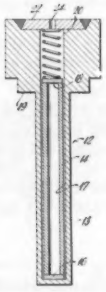
MAGNETOSTRICTIVE NON-CONTACTING PRESSURE DETECTION SYSTEM

James T. Russell, and Thomas J. Davis, both of Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Continuation of Ser. No. 558,124, Mar. 13, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,771

Int. Cl.³ H01L *41/14*

U.S. Cl. 310—26 **9 Claims**



1. A pressure measurement system comprising a pressurized system including a sensor located within said pressurized system comprising a material which has a magnetic permeability which is dependent upon stress applied thereto, and is responsive to the internal pressure of said pressurized system, sensing means operably associated with said pressurized system in proximate relation to said sensor within said pressurized system for developing a magnetic field upon energization which field penetrates the containment wall of said pressurized system and interrogates said sensor, said sensing means providing an output electrical signal which is proportional to the stress applied to said sensor, electronic circuit means connected to said sensor means for processing said output signal of said sensing means for providing a readout of said pressure in said pressurized system, and a reference sensing means located substantially close to said sensing means during energization of said sensing means, for providing temperature compensation for said pressurized system, wherein said electronic circuit means comprises a plurality of channels for processing the output voltages from said reference sensing means and said sensing means, and phase discrimination means for providing an output proportional to said pressure in said pressurized system.

4,289,988

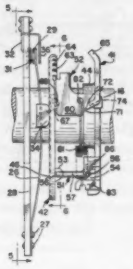
CENTRIFUGAL MECHANISM AND SWITCH

Edward J. Schaefer, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Continuation-in-part of Ser. No. 961,846, Nov. 20, 1978, abandoned. This application Oct. 5, 1979, Ser. No. 82,127

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—68 E **15 Claims**



1. In an electric motor including a rotatable shaft and a switch connected to control energization of a winding of the motor, the improvement comprising a centrifugal mechanism for actuating the switch, said mechanism comprising a support part secured to and rotating with the shaft, a movable annular member having a central opening receiving the shaft therethrough, a weight having its center of gravity to one side of the axis of rotation of the mechanism and the shaft, said weight extending between said support part and said annular member and being pivotally connected to said part and said member, said weight and said member swinging outwardly due to centrifugal force upon rotation of said mechanism, said weight and said annular member having a standstill position that exists when said mechanism is stationary and a running position that exists when said mechanism is turning at above a predetermined speed, centrifugal force acting on said weight and causing said outward swinging movement to said running position, and counterforce means directly connected to said weight and said support part and extending therebetween and causing movement to said standstill position, said annular member being adapted to engage said switch and said swinging movement of said annular member being adapted to actuate the switch.

4,289,989

BRUSHLESS EXCITER ROTOR MOUNTING

Patrick J. Schibline, Merrill, Wis., assignor to Marathon Electric Manufacturing Corp., Wausau, Wis.

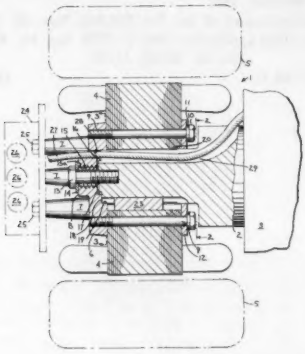
Filed Dec. 10, 1979, Ser. No. 101,480

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—261 **8 Claims**

1. The mounting of a brushless exciter rotor to a generator by a sleeveless construction, comprising a shaft extending from the generator and having a stepped construction of predetermined lengths providing a larger diameter in the shaft at the inner end portion and a lesser diameter portion in the shaft extending outwardly from the inner end portion, a rotor core with an inner diameter slightly larger than the lesser diameter portion of the shaft, an outer end member assembled to the outer end of the rotor core and having an inner diameter substantially in line with the lesser diameter portion of the shaft and disposed in a predetermined length of engagement with the shaft lesser diameter portion, an end member assembled to the inner end of the rotor core with the inside of the last named end member in a predetermined length of engagement with the larger diameter inner end portion of the shaft, the stepped construction of the shaft providing a radial clearance around the shaft between the rotor core and lesser diameter portion of the shaft for a predetermined length of the rotor core, means to

pull the rotor core to seating position with respect to the shaft and secure the rotor core to the shaft, means to secure the rotor core to the shaft to prevent rotation of the shaft within the rotor core, and means to secure the rotor core to the end members.



4,289,990

SPARK PLUG WITH A STEPPED INSULATOR AND AN INNER CONSTRICTION IN THE HOUSING

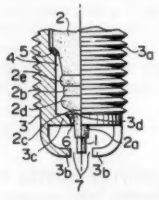
Kazuhisa Mayumi, Aichi; Katsumi Suzuki, Toyota, and Fujio Tsuboi, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and NGK Spark Plugs Co., Ltd., Nagoya, both of, Japan

Filed Mar. 14, 1979, Ser. No. 20,323

Claims priority, application Japan, Oct. 17, 1978, 53-143091[U]

Int. Cl.[3] H01T *13/20, 13/32*

U.S. Cl. 313—143 **1 Claim**



1. A spark plug comprising a central axial electrode, an insulator which covers said axial electrode except for its tip, and a housing which surrounds said insulator with an open tubular gap left therebetween and which at its tip portion furnishes at least one ground electrode which opposes the tip of said axial electrode, said housing being formed with a constriction on its inner surface which approaches said insulator at a portion near its tip portion with an open annular gap being left therebetween, wherein said insulator is formed with a first portion nearer to its root, a second portion nearer to its tip which is of generally smaller radius than said first portion, and a stepped portion between said first and second portions, and wherein the constriction has an annular inside surface which opposes both said second portion and said stepped portion, said constriction inside surface and the surfaces of said insulator at said second portion and said stepped portion being shaped to define an open annular gap therebetween which has a substantially constant width throughout its length, said open annular gap angling sharply radially outwardly from its portion which follows said second portion to its portion which follows said stepped portion of the insulator, said first portion of said insulator being formed with an annular bulge which extends in continuity with said stepped portion.

4,289,991

FLUORESCENT LAMP WITH A LOW REFLECTIVITY PROTECTIVE FILM OF ALUMINUM OXIDE

Willy P. Schreurs, Danvers, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 526,755, Nov. 25, 1974, abandoned. This application Sep. 6, 1977, Ser. No. 830,702

Int. Cl.[3] H01J *61/35, 61/42*

U.S. Cl. 313—489 **1 Claim**

1. In a fluorescent lamp comprising a sealed glass envelope containing a fill including low pressure mercury vapor, the improvement which comprises an antireflective film of aluminum oxide disposed on an electroconductive layer adhering to the inner surface of the glass envelope, wherein the thickness of the antireflective film is such as to increase both initial light output and lumen maintenance of the lamp.

4,289,992

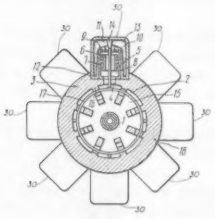
MICROWAVE DEVICE

Zinaida P. Kapitonova, ulitsa Ostrovityanova, 23, korpus 5, kv. 112, Moscow, U.S.S.R.

Filed Jun. 4, 1979, Ser. No. 45,341

Int. Cl.[3] H01J *25/50*

U.S. Cl. 315—39.77 **3 Claims**



1. A microwave device characterized by an operating frequency range having undesired modes on either side thereof, comprising:

a cathode emitting a stream of electrons;

an anode made up of individual cells receiving and interacting with the stream of electrons;

a coupling element provided in at least one of said cells of said anode;

a plurality of band-reject filters having a rejection band covering the operating frequency range of said microwave device, and each band-reject filter being connected in parallel with respective said at least one of said cells via respective said coupling element; and

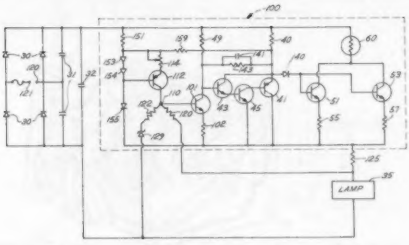
a plurality of broad-band microwave loads, located outside said anode, comprising shorted transmission line sections and having a variable characteristic impedance;

each respective said coupling element conveying said undesired modes from respective said at least one of said cells to said each band-reject filter, said each band-reject filter discriminating between desired modes and said undesired modes of said device, said plurality of broad-band microwave loads being electrically associated with said band-reject filters and having a microwave absorbing coating for suppressing the undesired modes on either side of said operating frequency range of said microwave device.

4,289,993
DIRECT CURRENT POWER SOURCE FOR AN ELECTRIC DISCHARGE LAMP

Clarence E. Harper, Yuciapa, Calif., and William J. Elliott, Zephyr Cove, Nev., assignors to Quietlite International, Ltd., Reno, Nev.

Continuation-in-part of Ser. No. 911,984, Jun. 2, 1978, abandoned. This application Jun. 29, 1979, Ser. No. 53,406
Int. Cl.³ H05B *41/36*
U.S. Cl. 315—311 **6 Claims**



1. In a electrical lighting system of the class comprising a resistive ballast circuit serially connected with an electric discharge lamp across a source of a direct current potential, the improvement comprising, in combination,

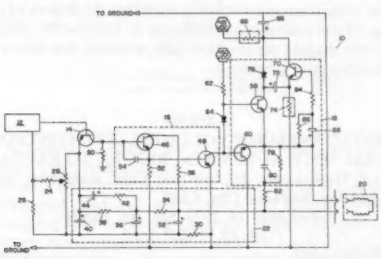
means for decreasing the effective resistance of said ballast circuit in response to a decrease in the magnitude of current flowing through said lamp below a variable threshold level, and

means for decreasing the value of said variable threshold level in response to an increase in the magnitude of voltage across said lamp.

4,289,994
VERTICAL DRIVE CIRCUIT FOR VIDEO DISPLAY

Gregory J. Beaumont, Arlington Heights, and Lloyd E. Mathews, Berwyn, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 20, 1979, Ser. No. 77,432
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—371 **4 Claims**



1 In a video display having a cathode ray tube energized by a first DC voltage source providing a first DC voltage level, with a vertical deflection yoke for sweeping an image across the screen of said cathode ray tube in a vertical direction by applying an input sawtooth current waveform including trace and retrace periods to said vertical deflection yoke, said input sawtooth current waveform including an S-shaped correction factor to compensate for the planar configuration of the face of said cathode ray tube, a DC-coupled vertical deflection drive circuit comprising:

means for generating a substantially linear, input sawtooth-shaped signal;

single signal feedback means responsive to deflection yoke current for removing said S-shaped correction factor from said sawtooth current waveform so as to generate a substantially linear, uncorrected sawtooth current waveform;

signal level comparator means coupled to said input sawtooth-shaped signal generating means and to said signal feedback means for generating a correction signal, the magnitude of said correction signal being determined by the difference between said input sawtooth-shaped signal and said uncorrected, feedback sawtooth current waveform;

amplification means coupled to said first DC voltage source for amplifying said yoke deflection correction signal;

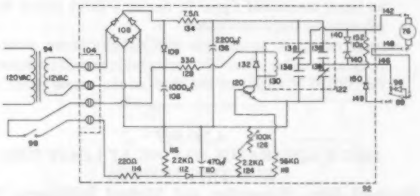
push-pull conducting means coupled to said amplification means for driving said deflection yoke with said yoke deflection correction signal, said push-pull conducting means connected to a second DC voltage source providing a second DC voltage level, said second DC voltage level being greater than said first DC voltage level; and

means for substantially increasing the voltage applied to said push-pull conducting means during electron beam retrace so as to shorten the retrace period.

4,289,995
ELECTRIC DOOR OPERATOR WITH SLIP CLUTCH AND DYNAMIC BRAKING

Robert E. Sorber, and James A. Gallion, both of Charlotte, N.C., assignors to Keane Monroe Corporation, Monroe, N.C.

Filed Aug. 1, 1979, Ser. No. 62,765
Int. Cl.³ H02K *7/10*
U.S. Cl. 318—9 **19 Claims**



1. An electrically driven operator for a door comprising a door operating linkage, electrically powered drive means connected to said linkage for applying an operating force to said door therethrough and capable of being continuously stalled while applying said operating force at the operating voltage of said drive means, slip clutch means connecting said drive means and said operating linkage for transmitting said operating force therebetween and having a resistance to slipping greater than the operating force of the drive means when stalled, and means for closing and maintaining the door in closed position against a stationary stop or obstruction by the application of the operating force with the drive means being continuously stalled by the obstruction without slipping of said clutch means.

4,289,996
ACTUATORS

Robin R. Barnes, Twickenham; Ronald F. Delves, Guildford, and James F. Slasor, Ockham Near Woking, all of England, assignors to Frazer Nash Ltd., Surrey, England

Filed Aug. 29, 1978, Ser. No. 937,820
Int. Cl.³ H02P *1/54*
U.S. Cl. 318—38 **9 Claims**

1. A powered linear actuator, comprising

a screw jack having a non-rotary rectilinearly-moving screwed shaft and a rotary non-rectilinearly-moving screwed sleeve surrounding the shaft in screw engagement therewith;

an axially aligned pair of electric motors coaxially surrounding the screwed shaft and sleeve;

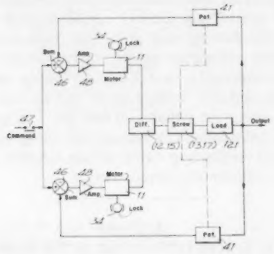
differential gearing coupling both said motors in driving relationship with said screwed sleeve, and including a pair of gears each individually driven by a respective one of said motors and a set of planetary pinions mounted on the screwed sleeve and meshing with both said gears, whereby said pair of motors share substantially equally in driving said screw jack;

a pair of motor locks, one for each motor, each automatically engaging to lock the respective motor against rotation in the event of motor circuit failure;

output position feedback potentiometer means operatively coupled to said screwed shaft and generating a feedback signal;

driving circuit means responsive to said feedback signal and an input command signal to derive a drive signal for applicaton to the motors; and

resistor means in series with said potentiometer means the resistance value of which is selectable at will to determine the length of stroke of the shaft of the screw jack.



4,289,997

DRIVE APPARATUS HAVING AT LEAST TWO ELECTRIC MOTORS

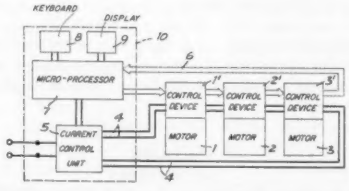
Bernhard Jung, Winnweiler, and Michael Teichmann, Obermoschel, both of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,130

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827340

Int. Cl.³ H02P *1/54*

U.S. Cl. 318—113 **10 Claims**



1. Drive apparatus, having a plurality of electric motors and a central control common to the plurality of motors, from which central control each motor can be turned on and off, comprising:

said plurality of motors lies in series in closed-circuit energy supply;

each of said plurality of motors has a control unit which can be turned on from the central control via a control line common to said plurality of motors by an address; and

each of said plurality of control units contains a short-circuit device connected in parallel with its connecting terminals.

4,289,998

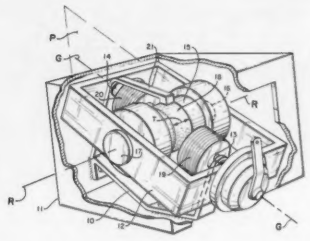
SINGLE PHASE DC BRUSHLESS MOTOR

Gerald F. Dulin, Torrance, Calif., assignor to Astronautics Corporation of America, Torrance, Calif.

Filed May 27, 1980, Ser. No. 153,138

Int. Cl.³ H02K *23/00*

U.S. Cl. 318—254 **4 Claims**



1. A single phase DC brushless motor including, in combination:

(a) a permanent magnet rotor made of ceramic material;

(b) stator windings adjacent to the periphery of the rotor, said stator windings being bobbin-wound without laminations and stationarily positioned adjacent to diametrically opposite sides of the rotor;

(c) a sole Hall cell adjacent to the rotor and stationary relative thereto responsive to rotation of the rotor to provide a commutating signal for switching current passed to the stator windings in synchronism with the speed of the rotor whereby slip rings and brushes are eliminated, and

(d) a gimbal mounting the rotor for rotation, the gimbal being mounted for turning movement about a gimbal axis at right angles to the axis of rotation of the rotor, the gimbal axis being coaxial with the stator windings so that magnetic flux interaction between the stator windings and the rotor is invariant with turning of the gimbal, said Hall cell being positioned juxtaposed to a central portion of the rotor, the axial width of the ceramic material making up the permanent magnet being such that the degree of turning of the gimbal is not sufficient to remove the influence of the magnet on the Hall cell, whereby the motor can function as a gyroscope.

4,289,999

DIGITAL VARIABLE VOLTAGE LEVEL CONTROL CIRCUIT WITH AUTOMATIC RETURN TO NEUTRAL

Robert P. Harshberger, Jr., San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 14, 1979, Ser. No. 38,951

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—341 **8 Claims**

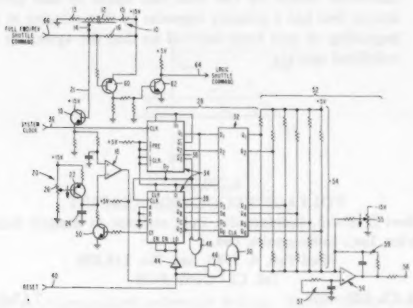
1. A control circuit for generating a readily varied analog output voltage signal for controlling the speed of a tape transport in a selected mode of operation, and including an operator generated control command commensurate with the desired speed from zero to maximum, comprising the combination of;

means including a touch control means for generating selected digital values which are representative of the operator generated control command;

said generating means including counter means for counting through a selected number of digital values within a preselected range of digital values in response to a fixed frequency clock; and comparator means coupled to the touch control means for selecting the selected digital

value within the preselected range of values in response to the operator control command;

means coupled to the counter means for digitally holding and continuously supplying a selected digital value for an extended time period in response to the comparator means; and



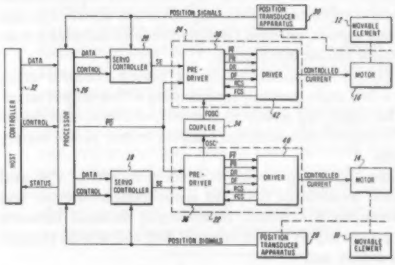
means for reconverting each continuously supplied digital value to define the desired analog output voltage signal representative of the operator generated control command.

4,290,000

POWER AMPLIFIER WITH CURRENT LIMITER CIRCUIT

Kai C. K. Sun, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1979, Ser. No. 63,638
Int. Cl.[3] G05B *9/02*
U.S. Cl. 318—566 **1 Claim**



1. A power amplifier for controlling the current flow through a load, comprising:

a plurality of switching elements connected in bridge fashion with said load and a predetermined power source for coupling the load across alternate output terminals of said power source in accordance with the levels of a pluraltiy of control signals respectively applied to said plurality of switching elements;

generating means responsive to an error signal for generating said control signals;

coupling means capable when enabled of coupling each of said control signals from said generating means to the respective switching element for controlling same;

sensing means coupled to said load for generating an actual current signal indicative of the actual level of current flow through said load;

current limiter means coupled to said sensing means and including a first comparator having a first input for receiving a first reference signal indicative of an upper level limit of current flow through said load, a second input for receiving said actual current signal, and an output for developing an upper limit disable signal when said actual current signal exceeds said first reference signal; a second comparator having a first input for receiving said actual current signal, a second input for receiving a second reference signal indicative of a lower level limit of current flow through said load, and an ouput for developing a lower limit disable signal when said second reference signal exceeds said actual current signal; and a gate coupled to the outputs of said first and second comparators for developing said current disable signal when either or both of said upper and lower limit disable signals are true; and

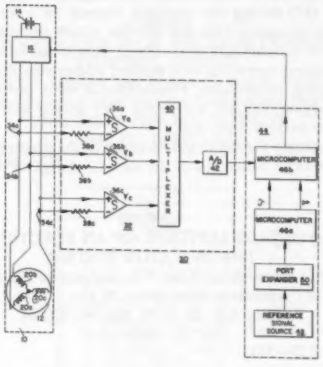
disable means coupled to said current limiter means and responsive to said current disable signal for virtually instantaneously disabling said coupling means whereby further current flow through said load is virtually instantaneously inhibited.

4,290,001

CLOSED LOOP, MICROCOMPUTER CONTROLLED PULSE WIDTH MODULATED INVERTER-INDUCTION MACHINE DRIVE SYSTEM

Paul M. Espelage, Salem, Va., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 3, 1979, Ser. No. 63,126
Int. Cl.[3] H02P *5/34, 7/42*
U.S. Cl. 318—811 **7 Claims**



1. For use with an inverter-induction machine drive system comprised of an n-phase induction machine (where n is an integer greater than zero) and an inverter which includes n pairs of solid state switching devices, each pair of said solid state switching devices coupled in series-aiding fashion across a source of potential and adapted for coupling at the junction between switching devices to a respective one of said n induction machine phases, improved apparatus for controlling torque and speed of said induction machine by controlling amplitude and frequency of inverter output voltage in accordance with an externally-varied amplitude value and frequency value, respectively, comprising:

(a) sensor circuit means for generating, from inverter output current and output voltage, an n phase output signal which varies in accordance with the actual magnitude of machine flux; and

(b) means coupled to said sensor circuit and to said inverter for generating an n-phase reference signal, the amplitude and frequency of which varies in accordance with the magnitude of said externally varied amplitude value and said frequency value, respectively, and for supplying an n-phase control signal to said inverter to vary the conduction of each of said inverter solid state switching devices of each of said pairs of inverter solid state switching de-

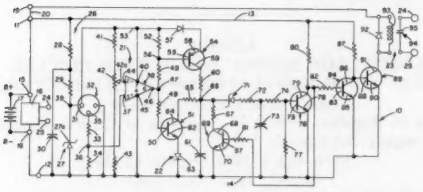
vice, said n-phase control signal varying in accordance with a prescribed relationship between the deviation in magnitude of said sensor circuit output signal from said reference signal and the deviation in magnitude of said sensor circuit output signal from a preset limit, said preset limit representing a predetermined maximum inverter current.

4,290,002

METHOD AND APPARATUS FOR CONTROLLING BATTERY RECHARGING

Peter B. Piotti, Westchester, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 4, 1979, Ser. No. 45,444
Int. Cl.³ H02J *7/04*
U.S. Cl. 320—20 **22 Claims**



1. A method of controlling the charging of a rechargeable battery (17) during the charging thereof by a ferroresonant charging apparatus (16) and the like which provides cyclical periods of substantially zero current flow to the battery during the charging operation, said method comprising the steps of:

digitizing information representative of a portion of the charging voltage waveform (W) during said period of zero current flow; and

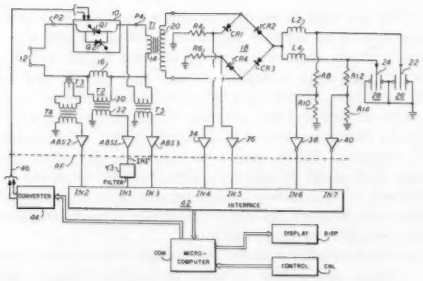
determining the duty cycle content of the digitized information as an indication of the state of charge of the battery.

4,290,003

HIGH VOLTAGE CONTROL OF AN ELECTROSTATIC PRECIPITATOR SYSTEM

Philip M. Lanese, Belle Mead, N.J., assignor to Belco Pollution Control Corporation, Parsippany, N.J.

Filed Apr. 26, 1979, Ser. No. 33,604
Int. Cl.³ B03C *3/68*
U.S. Cl. 323—241 **36 Claims**



1. In an electrostatic precipitator system including a voltage controller for producing from a primary alternating power source a variable output which varies in response to a control signal, a high voltage means comprising:

a high voltage converter means driven by said voltage controller for producing therefrom a variable high voltage; and

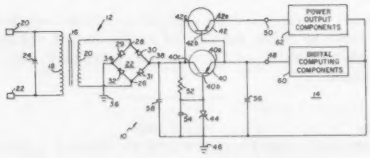
command means for producing and varying said control signal, said command means being operative to repress the drive to said converter means by a given amount in response to its loading exceeding a predetermined limit during a corresponding limit interval, said given amount being sized to interrupt the production of power by said converter means, said command means being operative after said limit interval to restore productive drive to said converter means by the next half cycle of said power source that has a polarity opposite to that existing at the beginning of said limit interval so that the system is restabilized quickly.

4,290,004

VOLTAGE REGULATOR CIRCUIT

Robert L. Smith, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Feb. 4, 1980, Ser. No. 118,558
Int. Cl.³ G05F *3/08*
U.S. Cl. 323—311 **7 Claims**



1. In an electronic system of the type including a power supply means, first component means powered by said power supply means, which first component means by their nature transmit interference signals to said power supply means, second component means powered by said power supply means, said second component means being adversely sensitive to said interference signals, wherein the improvement includes a voltage regulator circuit comprising:

a first bipolar semiconductor device having a control terminal, a first main terminal representing a first output terminal for supplying power to said second component means and a second main terminal coupled to said power supply means;

a voltage regulating device connected in series with said control terminal of first said semiconductor device and representing a common input-output terminal between said power supply means and said first and second component means; and

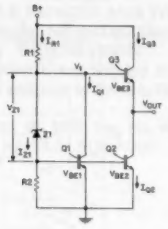
a second bipolar semiconductor device having a control terminal connected to said first main terminal of said first semiconductor device, a first main terminal representing a second output terminal with respect to said common input-output terminal for supplying power to first said component means and a second main terminal coupled to said power supply means,

wherein voltage regulation is provided at said first output terminal by a constant voltage drop across said voltage regulating device in combination with a constant voltage drop between said control terminal and said first main terminal of said first semiconductor device, further wherein voltage regulation is provided at said second output terminal by the regulation provided at said first output terminal in combination with a constant voltage drop between said control terminal and said first main terminal of said second semiconductor device, and further wherein said interference signals of said first component means are isolated from reaching said second component means.

4,290,005
COMPENSATED REFERENCE VOLTAGE SOURCE

Rangaswamy Arumugham, Acton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 7, 1980, Ser. No. 166,526
Int. Cl.[3] G05F 3/20
U.S. Cl. 323—313 13 Claims



1. A compensated reference voltage source comprising in combination

a first resistance means, a constant voltage means, and a second resistance means connected in series between a source of voltage and a point of fixed potential;

a first transistor having its collector electrode connected to the juncture of the first resistance means and the constant voltage means, its base electrode connected to the juncture of the constant voltage means and the second resistance means, and its emitter electrode connected to the point of fixed potential whereby changes in the voltage of the source of voltage change the current through the first transistor and consequently the base-to-emitter voltage and the collector electrode voltage of the first transistor;

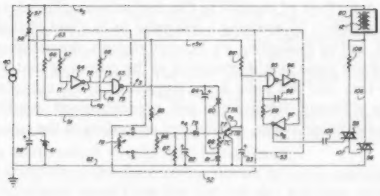
a second transistor having its base electrode connected to the base electrode of the first transistor, its emitter electrode connected to the emitter electrode of the first transistor whereby the base-to-emitter voltage of the second transistor is equal to the base-to-emitter voltage of the first transistor, and having its collector electrode connected to an output terminal; and

a third transistor having its collector electrode connected to the source of voltage, its emitter electrode connected to the output terminal, and its base electrode connected to the collector electrode of the first transistor whereby the voltage at the output terminal is related to the voltage at the collector electrode of the first transistor and the base-to-emitter voltage of the third transistor.

4,290,006
PROPORTIONAL A-C POWER CONTROL

Joseph T. Wallace, 4401 S. Juniper, Tempe, Ariz. 85282

Filed Oct. 1, 1979, Ser. No. 80,582
Int. Cl.[3] G05F 1/455
U.S. Cl. 323—326 8 Claims



1. A control circuit connected to an alternating current source for providing smooth and continuous current regulation to connected loads comprising:

a crossover detector for detecting the change in polarity of the alternating current source and generating a signal in response thereto,

a timing circuit connected to said crossover detector for receiving said signal,

said timing circuit being energized by said source for establishing an adjustable direct current reference potential and comprising a pair of capacitive means,

one of said capacitive means functioning as a timing device and being charged by said source under the control of said signal,

control means for receiving said signal and effecting the charging or discharging of said timing device depending on the value of said signal,

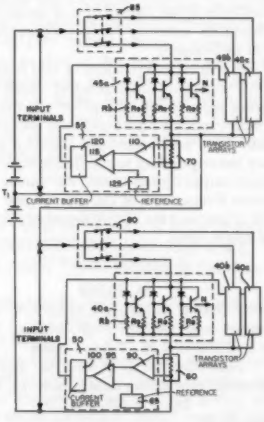
the other of said capacitive means being charged by said adjustable reference potential and connected to said control means for preventing said timing device from discharging below a value related to said reference potential,

whereby when said signal is relatively high said one of said capacitive means charges and when said signal drops to substantially zero it begins to discharge to a predetermined voltage value depending on the set value of said reference potential, said timing circuit generating an output signal relatively early in each half cycle of said source when said reference potential is high and generating an output signal relatively late in each half cycle when said reference potential is low.

4,290,007
HIGH POWER AND HIGH VOLTAGE TRANSISTOR CONTROL CIRCUIT

Bernard Fisher, Dayton, and Robert C. Storar, Xenia, both of Ohio, assignors to United Systems Corporation, Dayton, Ohio

Filed Dec. 3, 1979, Ser. No. 99,378
Int. Cl.[3] G05F 1/44
U.S. Cl. 323—270 4 Claims



1. A circuit for controlling current through a high voltage source including

a plurality of series connected transistor arrays,

means for sensing the current flow through each of said transistor arrays,

means associated with each transistor array and responsive to the current flow therethrough for applying control current to the base electrodes of the transistors within said arrays,

and means for providing a connection between the transistor arrays and a tap on the high voltage source such that the

voltage applied to each array is less than the critical voltage of the transistors within the array at the maximum current flow therethrough.

4,290,008

METHOD AND APPARATUS FOR DISCRIMINATIVELY DETERMINING ELECTRICAL CONSTANTS

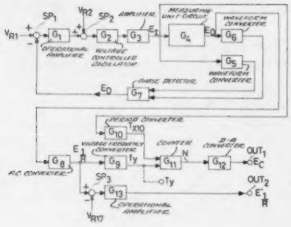
Yoshikazu Hoshino, Kusatsu, and Masayoshi Shuto, Suita, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Mar. 22, 1979, Ser. No. 22,835

Claims priority, application Japan, Apr. 5, 1978, 53/40733

Int. Cl.³ G01R *27/26, 27/02*

U.S. Cl. 324—57 R **20 Claims**



1. A method for discriminatively determining electrical characteristics of an object, said characteristics including a resistive part, a capacitive part, and an inductive part, and said object being within a detection cell of a measuring unit circuit, comprising the steps of:

maintaining a constant phase difference between the phase of an input signal to said measuring unit circuit and the phase of an output signal of said measuring unit circuit corresponding to the phase angle in a frequency transfer function of said measuring unit circuit;

determining a value corresponding to said resistive part in accordance with an amplitude quantity corresponding to the amplitude of the output of said measuring unit circuit, said amplitude quantity being proportional to the resistance of said object;

determining a value independent of said resistive part corresponding to one of other possible characteristics of said measuring unit circuit, said other possible characteristics being said capacitive part and said inductive part, in accordance with said amplitude quantity and a frequency quantity corresponding to the frequency of any one of the input and output signals of said measuring unit circuit, the respective frequencies of the input signal to said measuring unit circuit and the output signal of said measuring unit circuit being equal.

4,290,009

STANDING WAVE RATIO DETECTING APPARATUS

Konomu Sanpei, and Tadaaki Fujii, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1979, Ser. No. 38,277

Claims priority, application Japan, May 12, 1978, 53/55559

Int. Cl.³ G01R *27/04*

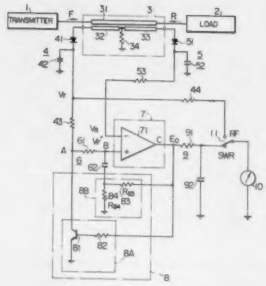
U.S. Cl. 324—57 R **5 Claims**

1. A standing wave ratio detecting apparatus provided with detector means for obtaining a traveling wave detection voltage V_F and a reflected wave detection voltage V_R and with a standing wave ratio indication meter, comprising:

an integration circuit connected to said detector means for integrating said traveling wave detection voltage V_F to deliver an integrated voltage V'_F;

a comparator circuit connected to said integration circuit and said detector means for comparing said integrated voltage V'_F from said integration circuit and said reflected wave detection voltage V_R from said detector means;

control means connected to said comparator circuit and said integration circuit for causing said integrated voltage V'_F from said integration circuit to be approximately equal to said reflected wave detection voltage V_R in response to the output voltage E_o of said comparator circuit, the output voltage of said comparator circuit having a duty ratio related to the ratio between the traveling wave detection voltage V_F and the reflected wave detection voltage V_R; and



a smoothing circuit connected to said comparator circuit and said standing wave ratio indication meter for deriving from said output voltage E_o of said comparator circuit an average voltage corresponding to the ratio V_R/V_F of said reflected wave detection voltage V_R to said traveling wave detection voltage V_F to supply said average voltage to said standing wave ratio indication meter.

4,290,010

METHOD AND APPARATUS FOR MEASURING TRANSMISSION CHARACTERISTIC OF A TEST OBJECT

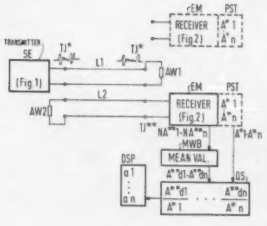
Gerhard Blaess, Olching, and Karl Bauernfeind, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 23, 1979, Ser. No. 96,792

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852747

Int. Cl.³ G01R *27/00*

U.S. Cl. 324—57 SS **19 Claims**



13. A method of measuring the transmission characteristics of a test object by applying a test pulse to an input of said test object, and by evaluating, by Fourier analysis, the deformation of said test pulse as it is produced at the output of said object under test, said test pulse being formed of plural components having different frequencies and predetermined amplitudes and initial phase angles, and formed according to the equation:

$$V_{(t)} = \sum_{i}^{n} A_n \cos(2 \cdot \pi \cdot n \cdot f \cdot t - \phi_n)$$

wherein A_n is the amplitude and ϕ_n is the initial phase angle of a component having a frequency n·f, including the step of:

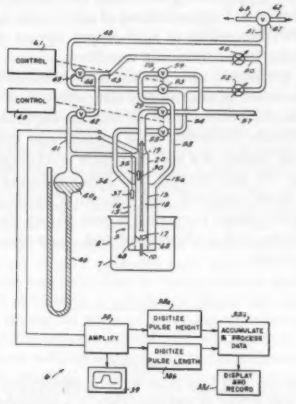
improving the signal-to-noise ratio of the measured values by reducing the relative width of the pass bands of said evaluation.

4,290,011

PARTICLE LENGTH AND VOLUME COMEASUREMENT WITH CONTROLLED ORIENTATION

Robert H. Berg, Elmhurst, and Richard F. Karuhn, Downers Grove, both of Ill., assignors to Particle Data, Inc., Elmhurst, Ill.

Filed May 18, 1978, Ser. No. 907,010
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—71 CP **20 Claims**



1. A method of controlling the presentation and traverse of elongated particles in fluid suspension to and through a sensing zone of greater length than the longest particle to be analyzed, to facilitate particle shape or size determination in a particle analysis system of a type responsive to electrical signals generated by particles passing through said sensing zone during an analytical time span, comprising:

effecting in a fluid-filled circuit all of the following steps in a manner effectively free from turbulence, continuously and sequentially in isokinetic laminar flow;

(a) transporting the particles through a first elongate passage of sufficient length to cause stable longitudinal orientation of the particles in a filamentary stream in said passage;

(b) transferring said filamentary stream of longitudinally oriented particles as a core stream enveloped in a particle-free cotraveling fluid sheath from the downstream end of said first passage and smoothly, and without disturbing the stable longitudinal orientation of the elongated particles, receiving said stream through the entrance end of a coaxially aligned sensing zone passage;

(c) advancing said fluid sheathed core stream through said sensing zone passage and maintaining the particles in said stable longitudinal orientation for particle shape or size determination as the particles generate signals while traversing the length of said sensing zone;

(d) discharging said fluid sheathed core stream of now waste particles from an exit end of said sensing zone passage into a continuation of said fluid filled circuit;

(e) controlling the flow of the stream of waste particles in movement away from the said exit end and thus avoiding straying, hangup or recycling of waste particles relative to said exit end;

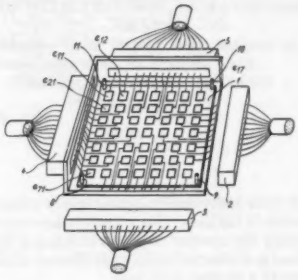
(f) and applying a constant differential pressure throughout said fluid filled circuit in effecting all of the foregoing steps during said analytical time span.

4,290,012

DEVICE FOR QUANTITATIVE DISPLAY OF THE CURRENT DENSITY WITHIN A CHARGED-PARTICLE BEAM

Marc Berte, and Pierre Legrand, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 5, 1979, Ser. No. 90,920
Claims priority, application France, Nov. 7, 1978, 78 31437
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—71 EB **4 Claims**



1. A device for displaying the distribution of current density within a beam of electrically charged particles, said device comprising a support plate of electrically insulating material having a surface area at least equal to the cross-sectional area of the beam, $m \times n = q$ electrically conducting elements fixed on the support plate being so arranged as to form a lattice of elements which consist of m lines and n columns and are intended to intercept the charged particles of the beam to a partial extent, said elements being electrically connected to systems which serve to process electrical signals collected by said elements and to display the density of the beam at $m \times n$ points of its cross-section, said device having a screen plate provided with $m \times n$ holes, said screen plate being placed above said support plate, each of said $m \times n$ holes being placed directly above one of said elements, said screen plate being of electrically insulating material.

4,290,013

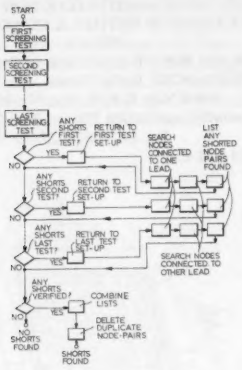
METHOD OF AND APPARATUS FOR ELECTRICAL SHORT TESTING AND THE LIKE

David W. Thiel, Acton, Mass., assignor to GenRad, Inc., Concord, Mass.

Filed Jun. 22, 1979, Ser. No. 50,993
Int. Cl.³ G01R *15/12*
U.S. Cl. 324—73 PC **20 Claims**

1. Apparatus for detecting shorts and the like between the nodes of a system under test, the system having a plurality of such nodes, and for identifying shorted nodes, comprising short detection means provided with a pair of leads across which a short is to be detected; a pair of switch-connecting means, one associated with each of the leads and adapted, respectively, to connect a group of nodes together and to connect an associated lead to said group of said nodes; and means for operating the pair of switch-connecting means to connect one lead to a first group of nodes, the first group having up to and including half of said nodes while simultaneously connecting the other lead to a second group of nodes, the second group including the remaining nodes; said operating means including means for successively varying the population of nodes in each group to connect different populations of said nodes to the leads in accordance with a predetermined pattern to enable successive screening tests for detecting shorts

between said different populations, said predetermined pattern varying the population of the group of nodes connected to each lead such that each node is tested against every other node at least once in substantially fewer tests than are required



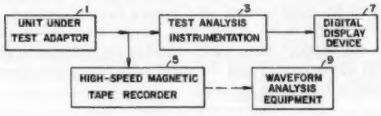
to test each node individually against every other node, and means operable in the event that a short is detected for successively reducing the number of nodes connected to each lead until each lead is connected to only one shorted node, to search for and identify a shorted node pair.

4,290,014

ANALOG/DIGITAL SYSTEM FOR EVALUATING BATTERY CHARACTERISTICS

Richard E. Tremaine, Clayton, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 1, 1978, Ser. No. 939,000
Int. Cl.[3] **G01R** *13/02, 13/04, 23/16, 31/36*
U.S. Cl. 324—77 A **6 Claims**



1. An analog/digital system for detection, measurement and evaluation of the characteristics of the output signal and the sporadically occurring noise signal of each cell of an energized electrical power source having at least one cell comprising:

(a) means for holding said electrical power source, said holding means having the capability to duplicate the conditions under which said electrical power source is to be energized;

(b) means for energizing said electrical power source, said energizing means cooperatively connected to said holding means and selectively activated when said conditions under which said electrical power source is to be used are achieved, each of said cells of said electrical power source outputting both a DC voltage and a superimposed AC noise voltage when energized;

(c) means for separately determining said DC voltage and the maximum level of said AC noise voltage output by each of said cells over discrete selectively variable time intervals, said determining means receiving as inputs said DC voltage and superimposed AC noise voltage outputs of each of said cells and transmitting as digital outputs the test characteristics of interest of said DC voltage and said maximum level of said AC noise voltage for each of said time intervals from each of said cells selectively;

(d) means for displaying hard copy real-time digital values of said test characteristics of interest occurring in said output signal of each of said cells for each of said time intervals, said displaying means receiving as inputs said digital outputs transmitted from said determining means and providing the capability for selective recall at a later time said digital values of said test characteristics of interest;

(e) means for storing for long terms said DC and said AC noise voltage output of each of said cells, said storing means having plural inputs and outputs and receiving as inputs said DC and said AC noise voltage output of each of said cells, said storing means having capability for providing as outputs reproductions of selected portions of said DC and said AC noise voltages for any of said discrete time intervals for which said real-time digital values of said test characteristics of interest have been measured; and

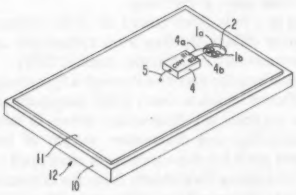
(f) means for performing waveform analysis on said selected portions of said reproductions of said output signals of said cells corresponding to said output signals of said cells occurring in real time, said waveform analysis being selectively performed only on said reproductions corresponding to certain of said discrete time intervals for which said test characteristics of interest indicate the existence of said sporadically occurring noise signals, said existence indicated by display of a high maximum level of said AC noise voltage for said discrete time interval during which said noise signal occurred, said waveform analysis of all said AC noise signals occurring in said output signals of said cells being said evaluation of said characteristics of said noise signal.

4,290,015

ELECTRICAL VALIDATOR FOR A PRINTED CIRCUIT BOARD TEST FIXTURE AND A METHOD OF VALIDATION THEREOF

Donald J. Labriola, Troy, N.Y., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Oct. 18, 1979, Ser. No. 86,220
Int. Cl.[3] **G01R** *31/00, 31/02*
U.S. Cl. 324—158 R **9 Claims**



1. A structure for validating the performance of a test fixture for a test system for printed circuit boards, the structure comprising:

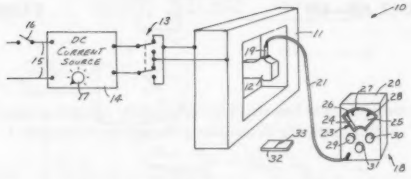
a board having (1) an electrically conductive sheet on a first region of a surface of the board and (2) a plurality of electrically conductive pads on a second region of the surface, the pads electrically isolated from each other and from the sheet, the board having no transistors formed on it; and

a test module having (1) a like plurality of first output leads corresponding on a one-to-one basis to the pads, each first lead attached to the corresponding pad, (2) a second output lead attached to the sheet, and (3) a like plurality of impedance elements corresponding on a one-to-one basis to the first leads, each impedance element connected between the second lead and the corresponding first lead.

4,290,016
METHOD AND APPARATUS FOR ESTABLISHING MAGNETIZATION LEVELS FOR MAGNETIC PARTICLE TESTING OR THE LIKE

Donald E. Lorenzi, Des Plaines, Ill., assignor to Magnaflux Corporation, Chicago, Ill.

Filed Dec. 28, 1978, Ser. No. 974,009
Int. Cl.[3] **G01N** *27/84;* **G01R** *33/12;* **G01N** *27/72;* **G01R** *35/00*
U.S. Cl. 324—216 **5 Claims**

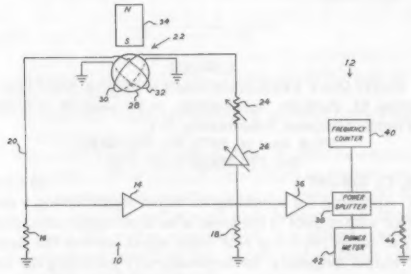


1. In a method of testing parts of various types of ferromagnetic material through detection of leakage fields at the surfaces of the parts for indication of defects therein, the steps of providing an eddy current testing instrument including probe means and including indicating means so calibrated as to produce a certain target indication under a reproducible standard condition, preparing at least a representative part of each type tested by establishing a demagnetized condition thereof and by establishing base metal characteristics at at least one surface portion thereof, placing said probe means against the said surface portion of each prepared part, adjustably applying a uni-directional magnetic field to each prepared part to establish a certain field level at which said target indication is produced, and testing all parts of the same type by applying a magnetic field at said certain field level while detecting leakage fields at surface portions thereof, said target indication and said reproducible standard indication being such that a magnetic field at said certain field level produces uniformly detectable leakage fields from shallow seams in any part of ferromagnetic material tested regardless of the type of ferromagnetic material of the part.

4,290,017
APPARATUS AND METHOD FOR NONDESTRUCTIVE EVALUATION OF SURFACE FLAWS IN CONDUCTIVE MATERIALS

Christopher M. Fortunko, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 26, 1978, Ser. No. 973,295
Int. Cl.[3] **G01N** *27/82;* **G01R** *33/12;* **G01N** *22/02*
U.S. Cl. 324—237 **17 Claims**



1. An apparatus for detecting a surface anomaly in an electrically conductive sample, comprising:

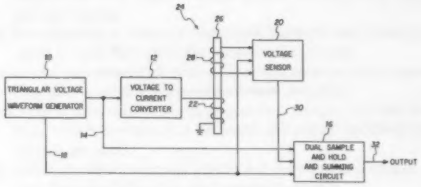
a two port ferromagnetic crystal probe, including an input port and an output port; and

an oscillating circuit, including a feedback loop, said ferromagnetic probe being coupled to said loop in a transmission mode through said input and output ports, whereby the precession resonance of the crystal thereby controls the frequency and level of oscillation of said oscillation circuit and eddy currents induced in the surface of the sample by the probe modulate the level and frequency of oscillation in response to a surface anomaly.

4,290,018
MAGNETIC FIELD STRENGTH MEASURING APPARATUS WITH TRIANGULAR WAVEFORM DRIVE MEANS

Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 22, 1979, Ser. No. 68,831
Int. Cl.[3] **G01R** *33/04*
U.S. Cl. 324—255 **4 Claims**



1. Apparatus for measuring magnetic field comprising in combination:

magnetic rod sensing means having a large length-to-diameter ratio and including drive and output windings;

triangular waveform drive means, including logic output means, connected to said drive winding for cyclically altering the magnetic field in a linear manner as a function of time between first and second magnetic field values, said logic output means providing output signals indicative of times at which the magnetic field reaches said first and second values; and

sample and hold means, connected to said output winding and to said logic output means, for outputting a signal indicative of sensed magnetic field as obtained by taking the average voltage appearing on said drive winding at times determined by signals received from said logic output means.

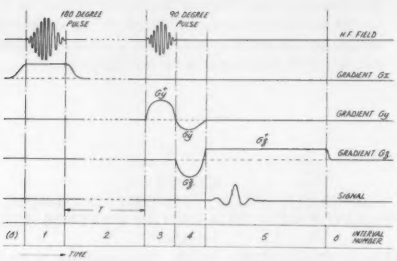
4,290,019
METHODS OF DERIVING IMAGE INFORMATION FROM OBJECTS

James M. S. Hutchison; John R. Mallard, and Robert J. Sutherland, all of Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

Filed Feb. 9, 1979, Ser. No. 10,913
Claims priority, application United Kingdom, May 31, 1978, 25899/78
Int. Cl.[3] **G01N** *27/00*
U.S. Cl. 324—311 **9 Claims**

1. A method of deriving image information from an object using nuclear magnetic resonance signals comprising the steps of subjecting an object to a static magnetic field along one axis, applying a first gradient to said magnetic field which varies in a direction orthogonal to said axis together with a 90° high frequency pulse, reversing the direction of said magnetic field

gradient and applying a second gradient to said magnetic field which varies in a direction orthogonal to said first gradient and



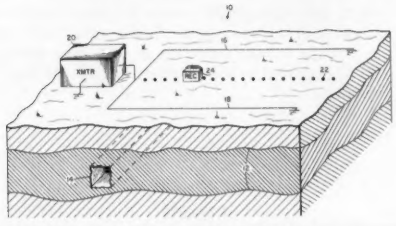
then reversing the direction of said second gradient while reading out the free induction signal from said object.

4,290,020

METHOD AND APPARATUS FOR DETECTING SUBTERRANEAN ANOMALIES BY GENERATING TWO PARALLEL MAGNETIC FIELDS

Peder M. Hansen; John G. Hoffman; Elwin W. Seeley, and Wesley A. Andrew, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 20, 1979, Ser. No. 31,721
Int. Cl.[3] G01V *3/08*
U.S. Cl. 324—334 **2 Claims**



2. In an apparatus for detecting subterranean anomalies wherein two parallel magnetic fields are generated and the strength of the field resulting from their intersection along a centerline midway between the fields is measured, the improvement comprising:

a source of alternating current having one grounded terminal and another, nongrounded terminal; and

a pair of substantially parallel conductors placed on the earth in the vicinity of a suspected anomaly, each conductor being connected at one end to the nongrounded terminal of the current source and at the other end in its characteristic impedance;

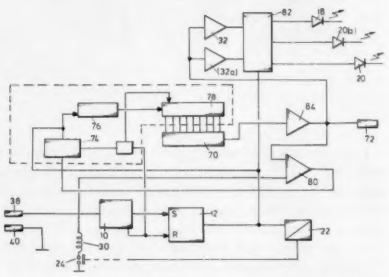
whereby, uniform in-phase currents flow in the conductors generating a magnetic field around each conductor.

4,290,021

BATTERY TESTING METHOD AND DEVICE

Jacob J. Theron, 57 Charlie Ave., Fontainebleau, Randburg, Transvaal; Bernardus J. Bout, Plot No. 47, Blignautsrus, Walkerville, Transvaal; Jacobus P. Van Wyk, 25 Second Ave., Florida, Transvaal, and Michael D. De Lange, 12 Godalming Ave., Mulbarton, Johannesburg,Transvaal, all of South Africa

Filed May 1, 1979, Ser. No. 35,274
Claims priority, application South Africa, May 1, 1978, 78/2491
Int. Cl.[3] G01N *27/46*
U.S. Cl. 324—429 **8 Claims**



4. Apparatus for testing the condition of a battery, comprising:

a first level detector for sensing battery voltage;

a timer;

a non-resistive constant current load;

a tapped constant voltage source;

a second level detector for sensing battery voltage;

voltage comparator means; and

circuitry means for: interconnecting a battery to said first level detector; interconnecting said first level detector to said timer so that said timer will be actuated if the battery voltage sensed by said first level detector is greater than a predetermined minimum; interconnecting said timer and the battery with said constant current load so that said load will draw constant current from the battery for a predetermined period of time determined by the timer; interconnecting said second voltage detector with the battery so that said constant current load; and interconnecting said tapped constant voltage source and said second voltage detector with said comparator means to determine whether or not the sensed voltage is greater than a predetermined amount set by said tapped constant voltage means.

4,290,022

DIGITALLY PROGRAMMABLE PHASE SHIFTER

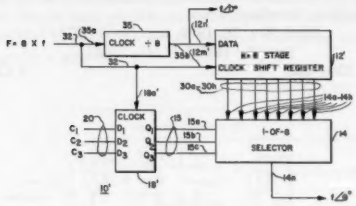
Charles M. Puckette, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 16, 1979, Ser. No. 30,013
Int. Cl.[3] H03K *5/15, 3/86*
U.S. Cl. 328—55 **10 Claims**

1. Apparatus for providing an output signal having a phase shifted with respect to the phase of an input signal, comprising:

first means receiving said input signal, having the desired output frequency, for simultaneously providing the input signal at a reference phase and a plurality K of signals each having the same waveshape as the input signal and at the input frequency and with each signal having a different one of K phases of $2\pi N/K$ radians, with respect to the input signal phase, where N is an integer between one and K; and

second means for synchronously selecting one of the K signals from said first means to provide the phase shifted



output signal with a selected phase and with all phase shift changes occurring at transitions of the input signal.

4,290,023

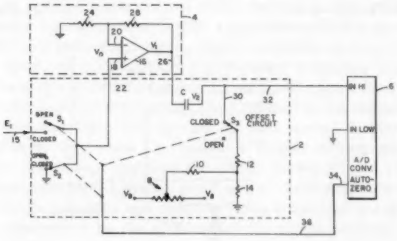
VOLTAGE OFFSET CIRCUIT FOR AUTO-ZERO LOW VOLTAGE AMPLIFIER

George Greenfield, W. Orange, N.J., assignor to S[illegible]mo Weston, Inc., Norcross, Ga.

Filed Sep. 10, 1979, Ser. No. 74,006

Int. Cl.[3] H03F *1/02*

U.S. Cl. 330—9 **8 Claims**



1. A voltage offset circuit for use with an amplifier having an input and an output, said input connected to receive input signals, said offset circuit comprising:

(a) sensing and storing circuit means for correcting internal offset voltages generated by said amplifier, said circuit means including:

(i) capacitor means connected on one side thereof to said amplifier output, and

(ii) switch means operable in a first position for connecting another side of said capacitor means to ground, and for connecting said amplifier input to ground thereby forming a sensing and storing path between said amplifier input and output, and operable in a second position to disconnect said path and connect said amplifier input to receive said input signals,

(b) voltage generating means connected between said another side of said capacitor means and ground for providing an additional offset voltage in said sensing and storing path, and

(c) means for adjusting said additional offset voltage.

4,290,024

VOLTAGE-TO-CURRENT CONVERTER CIRCUIT

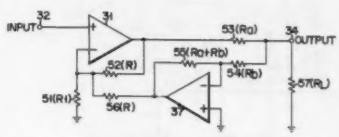
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 2, 1980, Ser. No. 136,448

Claims priority, application Japan, Apr. 13, 1979, 54-44961

Int. Cl.[3] H03F *1/26*

U.S. Cl. 330—85 **7 Claims**



1. A voltage-to-current converter circuit for proportionally converting an A.C. input voltage into an A.C. output current, and having a high input impedance, comprising:

a first amplifier having a noninverting input connected to receive an A.C. input voltage signal, an inverting input and an output;

a first impedance element connected between said inverting input of said first amplifier and circuit ground;

a second impedance element connected between said output and said inverting input of said first amplifier;

an output terminal for supplying an A.C. output current to a load which is connected between said output terminal and circuit ground;

a third impedance element connected between said output of said first amplifier and said output terminal;

a second amplifier having a noninverting input connected to circuit ground, an inverting input and an output;

a fourth impedance element connected between said inverting input of said second amplifier and said output terminal;

a fifth impedance element connected between said inverting input and said output of said second amplifier; and

a sixth impedance element connected between said output of said second amplifier and said inverting input of said first amplifier;

whereby an A.C. output current proportional to and in phase with said A.C. input voltage is supplied to a load which is connected between said output terminal and circuit ground.

4,290,025

AMPLIFIER ARRANGEMENT WITH VARIABLE GAIN FACTOR

Rudy J. van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 26, 1979, Ser. No. 15,547

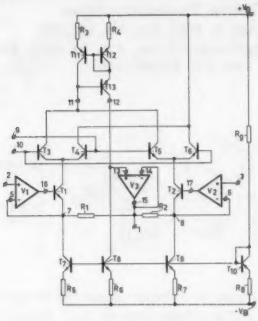
Claims priority, application Netherlands, Mar. 20, 1978, 7802973

Int. Cl.[3] H03F *3/45*; H03G *3/30*

U.S. Cl. 330—254 **17 Claims**

17. A variable gain amplifier comprising, first, second, third and fourth transistors each having first and second electrodes defining a current path in the transistor and a control electrode, means interconnecting the first electrodes of the first and second transistors, means interconnecting the first electrodes of the third and fourth transistors, means interconnecting the control electrodes of the first and fourth transistors and the control electrodes of the second and third transistors to form first and second input terminals, respectively, for receiving a variable control voltage, an output terminal of the amplifier coupled to the interconnected second electrodes of the first and third transistors, means for applying quiescent currents to the interconnected first electrodes of the first and second transistors and to the interconnected first electrodes of the third and fourth transistors, and means for applying a signal current to the interconnected first electrodes of the first and second

transistors comprising first and second voltage-current converters each having a first input coupled to the output terminal



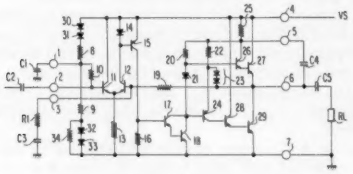
to provide a negative feedback and one converter having a separate signal voltage input terminal that is indepedent of said output terminal.

4,290,026

POWER AMPLIFIER WHOSE BIAS VOLTAGE CHANGES DEPENDING ON POWER SUPPLY VOLTAGE

Masashi Shoji, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,315
Claims priority, application Japan, Jul. 25, 1978, 53/91093
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—255 **12 Claims**



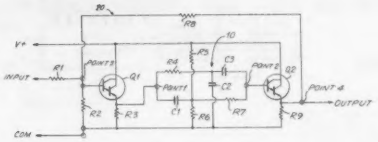
1. A power amplifier comprising a differential amplifier having a first input terminal receiving an input signal and a second input terminal, a bias circuit connected between first and second power supply terminals and having a bias terminal coupled to said first input terminal, a drive stage receiving the output from said differential amplifier, a single-ended push-pull output stage driven by said drive stage, an output terminal coupled to said single-ended push-pull output stage, a feedback circuit coupled between said output terminal and said second input terminal, said single-ended push-pull output stage having a first compound transistor coupled between said first power supply terminal and said output terminal and a second compound transistor coupled between said output terminal and said second power supply terminal, said first compound transistor being activated by a voltage applied between said first power supply terminal and said output terminal, said second compound transistor being activated by a second voltage applied between said output terminal and said second power supply terminal, said first voltage being larger than said second voltage, said bias circuit including a first series connection of a first constant voltage generating means and a first resistor inserted between said first power supply terminal and said bias terminal and a second series connection of a second constant voltage generating means and a second resistor inserted between a said bias terminal and said second power supply terminal, and a third resistor connected in parallel to said second constant voltage generating means.

4,290,027

FAIL-SAFE ACTIVE BANDPASS FILTER USING A MODIFIED TWIN-T FILTER

John W. Parker, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Nov. 26, 1979, Ser. No. 97,573
Int. Cl.³ H03H *11/12, 7/065*
U.S. Cl. 330—293 **9 Claims**



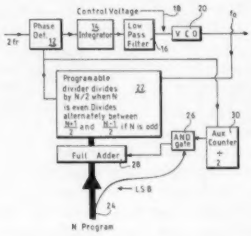
1. A fail-safe active bandpass filter circuit comprising:
a first section including a twin-T filter network, which has a plurality of resistors and capacitors, connected between a first point and a second point, the voltage gain of said network being greater than one;
a power source connected to said twin-T network;
a second section including a first resistor connected between a common or reference point and the input of said twin-T network;
a second, feedback resistor connected from the output to the input of said twin-T network such that the loop gain is less than one.

4,290,028

HIGH SPEED PHASE LOCKED LOOP FREQUENCY SYNTHESIZER

Jesse S. LeGrand, Clifton, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 30, 1979, Ser. No. 61,723
Int. Cl.³ H03L *7/18*
U.S. Cl. 331—1 A **19 Claims**



1. A phase locked loop type frequency synthesizer comprising:
a reference signal source;
a division factor program source providing a predetermined selected digital number N represented by a plurality of digital bits;
a voltage controlled oscillator (VCO) having an input and an output to provide an output signal for said synthesizer;
a phase detector having a first input coupled to said reference signal source, an output coupled to said input of said VCO and a second input;
a programmable divider having a first input coupled to said program source, a second input coupled to said output of said VCO and an output coupled to said second input of said phase detector, said divider being responsive to said predetermined number N for dividing said synthesizer output signal by a given division number M, where M is equal to N/x when said predetermined number N is even and is equal alternately to (N−1)/x and (N+1)/x when

said predetermined number N is odd, where x is an integer less than said predetermined number N; and

first means coupled to said output of said divider and said program source responsive to a given one of said plurality of bits of said predetermined number N to control said divider so that the average value of said given number M can be a non-integer.

4,290,029

DIGITAL PHASE CONTROL CIRCUIT INCLUDING AN AUXILIARY CIRCUIT

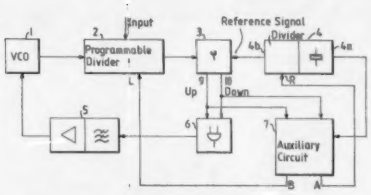
Wulf-Christian Streckenbach, Hemmingen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 106,161

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1978, 2856211

Int. Cl.³ H03L *7/10, 7/18*

U.S. Cl. 331—1 A **5 Claims**



1. In a digital phase control circuit including a controllable oscillator having a control input; a programmable first divider having first and second inputs, said first input being coupled to the output of said oscillator; a reference frequency source comprising a second divider having an input; a phase discriminator having first and second inputs coupled to the outputs of said programmable first divider and said second divider respectively, said phase discriminator further having output means; and means coupling the output means of said phase discriminator to the control input of said controllable oscillator, the frequency of said oscillator being controlled in a direction determined by the direction of the phase deviation between the signals applied to the first and second inputs of said phase discriminator and compared therein; the improvement comprising:

an auxiliary circuit having input means coupled to the output means of said phase discriminator, a first output coupled to the input of said second divider comprising said reference frequency source and a second output coupled to the second input of said programmable first divider, said auxiliary circuit generating a first synchronizing signal at the input of said second divider when the phase difference between the signals at the outputs of said programmable first divider and said second divider is in one direction and generating a second synchronizing signal at the second input of said programmable first divider when the phase difference between the signals at the outputs of said programmable first divider and said second divider is in the opposite direction thereby setting either said programmable first divider or said second divider, respectively, to a predetermined initial phase position, the divider set to said predetermined initial phase position being maintained in said position until the other divider reaches its predetermined initial phase position.

4,290,030

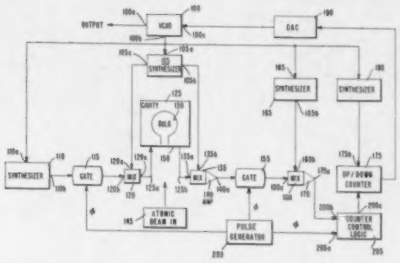
ATOMIC FREQUENCY STANDARD USING FREE INDUCTION TECHNIQUE

Harry T. Wang, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 29, 1979, Ser. No. 43,075

Int. Cl.³ H03L *7/26*

U.S. Cl. 331—3 **21 Claims**



1. A maser atomic frequency standard clock comprising:

a microwave cavity;

an oscillator generating an oscillator signal;

an atom storage bulb in said cavity;

means for injecting atoms of a selected magnetic spin orientation into said storage bulb;

means for stimulating coherent emission from said atoms referenced to said oscillator signal;

pulsing means for temporarily connecting said stimulating means to said cavity during a first time period and then disconnecting said stimulating means from said cavity for a second time period;

means for sensing said coherent emission during said second time period exclusively, whereby said sensing means generates a maser output signal having a phase and frequency which is substantially unaffected by said stimulating means;

means for comparing the frequency of said maser output signal with the frequency of said oscillator signal to generate a difference signal in response thereto; and

means for changing the frequency of said oscillator signal so as to null said difference signal.

4,290,031

COMBUSTOR FOR GAS DYNAMIC LASER

Robert G. Carroll, West Palm Beach; John I. Caporini, Palm Beach Gardens, and William J. Egan, Lake Park, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

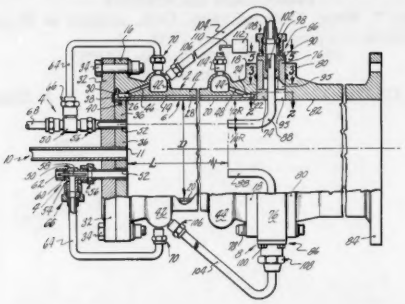
Filed Jul. 18, 1979, Ser. No. 58,714

Int. Cl.³ H01S *3/05*

U.S. Cl. 331—94.5 G **12 Claims**

1. In a gas dynamic laser device; a combustor, said combustor having a combustion chamber with a discharge opening at one end; primary injection means for injecting a combustible mixture into said combustion chamber at the other end of the chamber; said primary injection means having a plurality of injector tubes; an igniter for igniting a combustible mixture; secondary injection means located adjacent the discharge opening for ejecting an oxidizer into said combustion chamber; said secondary injection means having a plurality of nozzle

tubes, one nozzle tube for each injector tube of said primary injection means; each nozzle tube and injector tube being



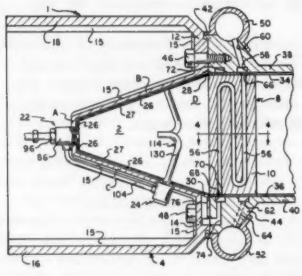
axially aligned with said nozzle tubes directing the oxidizer towards the injector tubes.

4,290,032

LINEAR COMBUSTOR FOR GAS DYNAMIC LASER

Robert J. Vogel, Palm Beach Gardens, Fla., and Roger L. Wahl, Camarillo, Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 18, 1979, Ser. No. 58,715
Int. Cl.³ H01S *3/08*
U.S. Cl. 331—94.5 D **5 Claims**



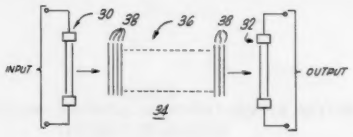
1. In a gas dynamic laser device; an elongated linear combustor; said combustor having a combustion chamber of trapezoidal cross-section with an elongated open end, said chamber being formed by a short front plate and two side plates extending rearwardly at an outwardly extending angle, each side plate having a rear end at the elongated open end of said combustion chamber; said combustor having a short flange extending outwardly from the rear end of each side plate, each short flange having a first end away from its cooperating side plate; an elongated plate extending forwardly from the first end of each short flange to a point located in front of said short plate; a plurality of ribs spaced adjacent one another along said elongated linear combustor normal to the side plates of the combustion chamber; said ribs being fixed to the short front plate, two side plates, short flanges, and elongated plates for supporting said combustion chamber.

4,290,033

SHALLOW BULK ACOUSTIC WAVE DEVICES EMPLOYING ENERGY TRAPPING

Reynold S. Kagiwada, Los Angeles; Kuo-hsiung Yen, Manhattan Beach, and Kei-fung Lau, Harbor City, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jun. 4, 1979, Ser. No. 45,159
Int. Cl.³ H03H *9/54, 9/64, 9/30*
U.S. Cl. 333—141 **20 Claims**



1. A shallow bulk acoustic wave device, comprising:

a piezoelectric substrate having a surface;

at least one sending transducer and at least one receiving transducer, both disposed on said substrate surface in such a manner as to provide substantial coupling of shallow bulk acoustic waves and negligible coupling of surface acoustic waves; and

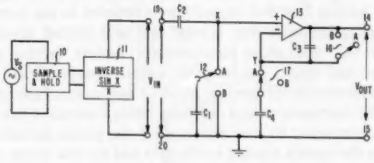
means for trapping electroacoustic energy close to said substrate surface, to reduce spreading of the energy into the substrate and thereby reduce insertion loss of the device.

4,290,034

SWITCHED CAPACITOR FILTER

Donald L. Fraser, Jr., Warren Township, Somerset County, N.J., and Armando J. Vera, Methuen, Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 16, 1980, Ser. No. 150,459
Int. Cl.³ H03H *19/00*
U.S. Cl. 333—173 **7 Claims**



1. A sampled-data filter circuit comprising: at least one input portion (**19**), at least one output portion (X) and at least one reference level portion (**20,15**); first and second capacitors (C_1 and C_2) with one electrode of at least one capacitor (C_1) coupled to the reference portion and one electrode of the other capacitor (C_2) coupled to the output portion, and switching means (**12**) for alternatively connecting one electrode of said first capacitor to two of said portions so as to simulate the electrical characteristics of a resistor between said portions, CHARACTERIZED IN THAT the capacitances of said first and second capacitors have a value in accordance with the relationship:

$$C_1/C_2 = e^{\frac{2\pi f_p}{f_s}} - 1$$

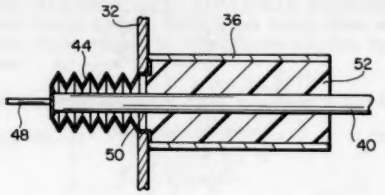
where f_p is the pole frequency of the filter and f_s is the sampling frequency.

4,290,035

MECHANICAL FILTER AND METHOD OF ACOUSTICALLY COUPLING WAVEGUIDES THEREIN

Fred G. Geil, Annapolis, and John H. Thompson, Severna Park, both of Md., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 30, 1978, Ser. No. 955,889
Int. Cl.³ H03H 9/50, 9/10
U.S. Cl. 333—186 15 Claims



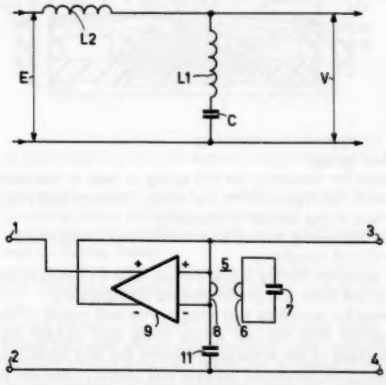
1. A mechanical filter comprising a housing having a wall,
a mechanical resonator supportably mounted within said housing,
a first waveguide,
an axially compliant member having an open end and a closed end with said open end attached to said wall,
means attaching said first waveguide to the closed end of said compliant member with said first waveguide extending axially through said wall and into said housing and attached to the interior surface of said closed end of said compliant member, and
a second waveguide attached to the exterior surface of the closed end of said compliant member and to said resonator whereby mechanical vibrations are coupled from said first waveguide to said second waveguide through the closed end of said compliant member.

4,290,036

FILTER CIRCUIT ARRANGEMENT

Kenneth W. Moulding, Horley, and Gordon A. Wilson, Reigate, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,729
Claims priority, application United Kingdom, Apr. 30, 1979, 15009/79
Int. Cl.³ H03H 11/08
U.S. Cl. 333—215 4 Claims



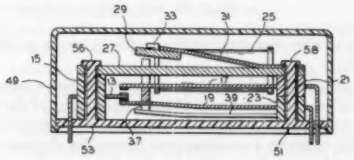
1. A filter circuit arrangement comprising an inductive element and an electronic reactance circuit, said electronic reactance circuit comprising an amplifier arrangement the input of which is connected across said inductive element and the output of which is coupled to said inductive element, characterised in that said inductive element is constituted by a first port of a gyrator circuit the second port of which is capacitively loaded, in that said amplifier arrangement, is a voltage amplifier arrangement, the output circuit of which is connected effectively in series with an input signal path through said inductive element in such manner that said output circuit is external to the circuit loop which includes the reactive element and the input circuit of the voltage amplifier, in that a capacitive element is included in series in said input signal path, in that first means are provided for presenting an input signal path, in that first means are provided for presenting an input signal voltage across the effective series arrangement of the inductive element, the capacitive element and said output circuit, in that second means are provided for deriving an output signal voltage from across a part of said series arrangement which includes said capacitive element and said inductive element, and in that said output circuit is connected in said series arrangement in such a sense that, within this series arrangement, the signal voltage produced across said output circuit by the voltage amplifier when said input signal voltage is present will be in phase with the signal voltage occurring across said inductive element.

4,290,037

FLAT ELECTROMAGNETIC RELAY

Takashi Inagawa; Naoto Kushida; Akira Sekiguchi; Matujiro Ikeda; Hidetoshi Sugawara, and Kunio Naito, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,217
Claims priority, application Japan, Feb. 28, 1978, 53/23116; Feb. 28, 1978, 53/23117; Feb. 28, 1978, 53/25872[U]; Feb. 28, 1978, 53/25873[U]; Feb. 28, 1978, 53/25874[U]
Int. Cl.³ H01H 9/0 2, 13/04, 67/02, 3/00
U.S. Cl. 335—202 8 Claims



1. An electromagnetic relay comprising:
a base member having a generally flat surface, and at least first and second projections standing substantially perpendicularly at predetermined positions on said surface thereof and having free ends, respectively;
first and second contact block means respectively fitting over said first and second projections to rest upon said surface, said first and second contact block means respectively holding stationary and movable contacts;
yoke means with an associated coil fitted over both said first and second projections to rest on said first and second contact blocks;
hinging leaf sping means fitted over one of said first and second projections and carrying an armature means for moving said movable contact in response to energization and deenergization of said coil; and
means associated with the free ends of said projections for holding together said contact block means, said yoke means and said leaf spring means; wherein said first and second contact block means are made of a mouldable material and hold said stationary and said movable contacts with individually associated first and second leaf springs having portions extending away from and beyond opposite surfaces of an individually associated one of said

first and said second contact block means, the first end portions of said first and said second leaf springs being substantially aligned with the respective moulded blocks to carry said contacts thereon, the second end portions of said first and said second leaf springs being bent substantially perpendicular to an end surface on each of said first and said second moulded blocks from which the second end portion of the leaf springs extends; and wherein said end surface on each of said first and second moulded blocks is inclined to form an acute angle with respect to the bent end portion of the leaf spring.

4,290,038

SCANNING-AREA ROTATION DEVICE FOR AN IMAGE PICKUP TUBE

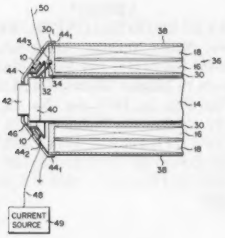
Junichi Yamanaka, Sagamihara; Noboru Nakamura, Yokohama; Hirokazu Fujiki, Asakusabashi, and Yoshimori Miyaji, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 14, 1979, Ser. No. 66,764

Claims priority, application Japan, Aug. 18, 1978, 54-113140[U]

Int. Cl.³ H01J *31/26*

U.S. Cl. 335—214 **7 Claims**



1. A scanning-area rotation device for an image pickup tube comprising:

an image pickup tube having a target including a target face

first means, positioned near the outer periphery of the target, for providing a static magnetic field to said target face in order to rotate a scanning-area thereof by electron beams on said target face; and

second means for electrostatically and not magnetically shielding said first means from the target.

4,290,039

AC SOLENOID APPARATUS OF THE ARMATURE IN TUBE TYPE

Ikuo Tochizawa, Takaoka, Japan, assignor to Kabushiki Kaisha Fujikoshi, Toyama, Japan

Filed Oct. 23, 1979, Ser. No. 87,487

Claims priority, application Japan, Oct. 26, 1978, 53-130991

Int. Cl.³ H01F *7/08*

U.S. Cl. 335—262 **4 Claims**

1. An AC solenoid apparatus for operating a valve comprising:

a relatively thin pressure proof tube made from nonmagnetic material, said tube having a longitudinal axis;

an armature slidably positioned within said tube for movement along said longitudinal axis in contact with the inner face of said tube;

a stationary core secured to one end of said pressure proof tube, said core having an axial bore along which oil can circulate between said valve and the interior of said pressure proof tube;

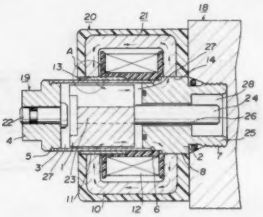
an end member sealingly attached to the other end of said pressure proof tube;

a pin positioned within the axial bore of said stationary core and engageable with said armature; and

an exciting assembly including;

a coil surrounding said pressure proof tube, said armature moving axially within said tube when said coil is energized by current flowing therethrough;

a generally rectangular yoke having a pair of longitudinal side faces with openings therein surrounding said coil,



said yoke having slots in each of said longitudinal side faces connecting said openings with the outside of said yoke; and

a slotted annular ring made from magnetic material, said ring being interposed between said pressure proof tube and at least one opening of said yoke, the slot in said ring being in alignment with a slot in said yoke, said ring having an annular length greater than the thickness of said yoke.

4,290,040

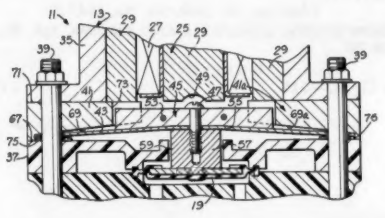
ELECTROMAGNETIC ACTUATOR HAVING PRELOADED SPRING MEANS

L. Clark Feightner, P.O. Box 10, El Dorado Hills, Calif. 95630, and E. Dale Hartley, 2700 Jalmia Dr., Los Angeles, Calif. 90046

Filed Sep. 17, 1979, Ser. No. 76,344

Int. Cl.³ H01F *7/08*

U.S. Cl. 335—274 **10 Claims**



1. An apparatus comprising:

a leaf spring;

means for mounting the leaf spring at least at two locations with the region of the leaf spring between said two locations being resiliently movable;

said leaf spring having a predetermined configuration in its relaxed condition;

an armature having a first surface with a configuration different from said predetermined configuration;

means for mounting said armature on said region of the leaf spring with the leaf spring being held against the first surface of the armature whereby the first surface of the armature resiliently deflects said region of the leaf spring to preload the leaf spring;

electromagnetic means energizable to apply a force to the armature to move the armature along a path from a first position to a second position against the biasing force of

the leaf spring to increase the load on the leaf spring, said spring moving said armature along said path from said second position toward said first position when the electromagnetic means is de-energized; and

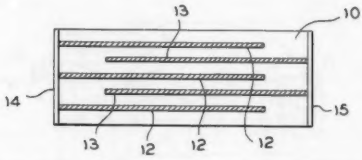
means for progressively increasing the spring rate of the spring as the armature moves along said path from said first position toward said second position.

4,290,041

VOLTAGE DEPENDENT NONLINEAR RESISTOR

Kazuaki Utsumi; Nobuaki Shohata, and Tomeji Ohno, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1979, Ser. No. 9,777
Claims priority, application Japan, Feb. 10, 1978, 53/14238
Int. Cl.³ H01C *7/10*
U.S. Cl. 338—21 **11 Claims**



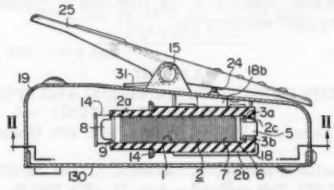
1. A voltage-dependent nonlinear resistor comprising a sintered body having a voltage-dependent nonlinear resistance and a plurality of internal electrodes arranged in parallel with each other, each of said internal electrodes being embedded within said sintered body, except for a portion led out to an external surface.

4,290,042

CONTROLLER FOR ELECTRIC MOTOR

Yoshitoshi Sato, Sukagawa, Japan, assignor to Yamamoto Electric Industrial Co., Ltd., Sukagawa, Japan

Filed Jul. 26, 1979, Ser. No. 60,870
Claims priority, application Japan, Aug. 30, 1978, 53-105291
Int. Cl.³ H01C *10/12*
U.S. Cl. 338—113 **5 Claims**



1. A controller for electric motors comprising:

a casing;

a carbon pile resistor contained within a through-hole of an insulating frame carried by said casing;

a U-shaped spring conductor plate with an end secured to said insulating frame;

a rotational plate pivotally supported on said casing;

a first terminal connected to an end of said carbon pile resistor; and

a second terminal connected to said conductor plate;

wherein the other end of said conductor plate is operatively coupled to said rotational plate, and is biased in response to the rotation of said rotational plate, for pressing the other end of said carbon pile resistor; and

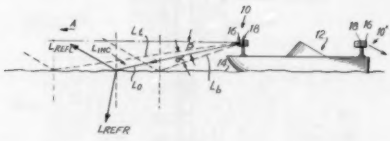
an arm member of an insulating material having one end pivotally supported on said rotational plate and the other end operatively coupled to said conductor plate, said arm member being adapted to move in the longitudinal direction of said carbon pile resistor in response to the rotation of said rotational plate, thereby moving the other end of said conductor plate in the same direction for pressing said carbon pile resistor.

4,290,043

METHOD OF AND SYSTEM FOR DETECTING MARINE OBSTACLES

Irwin M. Kaplan, 7 Barnett Pl., East Northport, N.Y. 11731

Filed Oct. 16, 1979, Ser. No. 85,239
Int. Cl.³ G08G *3/02*; G01C *3/08*
U.S. Cl. 340—29 **42 Claims**



1. A marine obstacle avoidance system for alerting a helmsman of a marine vehicle to the danger of maritime collision with floating and/or submerged obstacles, comprising:

(a) transmitter means mounted on the marine vehicle at a location above the air-water interface, for generating light radiation with at least one wavelength in the range including the ultraviolet light region, the visible light region and the infrared light region of the light spectrum, and thereupon for transmitting the generated light radiation as an incident light beam along a path which extends generally forwardly away from the marine vehicle, as considered along the forward direction of advancement of the vehicle, and downwardly towards the water surface at a predetermined angle below the horizon,

(1) one portion of the transmitted incident light beam being reflected off the water surface to constitute a reflected light beam which extends along a path only forwardly away from the marine vehicle and upwardly into the air, and

(2) another portion of the transmitted incident light beam being refracted into the water to constitute a refracted light beam which extends along a path only forwardly away from the marine vehicle and downwardly into the water,

said incident, reflected and refracted light beams being redirected in direction towards the marine vehicle when obstacles are located in their respective paths, and not being redirected towards the marine vehicle when obstacles are not located in their respective paths;

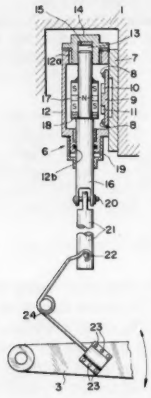
(b) receiver means mounted on the same marine vehicle for detecting the presence of any redirected light radiation which was initially transmitted by the transmitter means and which was thereupon reflected off obstacles lying in the paths of the incident light beam and/or the reflected lightbeam and/or the refracted light beam, and for also detecting the non-return of the incident, reflected and refracted light beams when no obstacles are located in their respective paths; and

(c) alarm means responsive to detection by the receiver means for alerting the helmsman to the presence of a floating obstacle in the paths of the incident light beam and/or the reflected light beam, and also for alerting the helmsman to the presence of a submerged obstacle in the path of the refracted light beam, whereby the helmsman is forewarned to the danger of a maritime collision of the marine vehicle with obstacles located generally forwardly of the same.

4,290,044
VEHICLE LEVEL DETECTOR

Hiroshi Ishikawa, 5-6447, Iriya, Zama-shi, Kanagawa-ken, and Mamoru Ichikawa, 715, Aiko, Atsugi-shi, Kanagawa-ken, both of Japan

Filed Jun. 19, 1979, Ser. No. 49,962
Claims priority, application Japan, Jun. 23, 1978, 53-76258
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—52 H 19 Claims

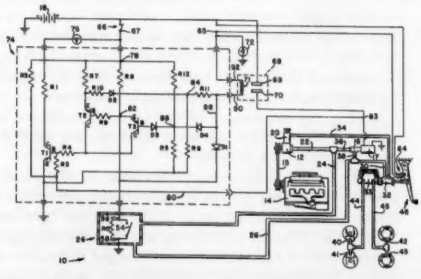


1. A vehicle level detector which detects a change in the elevation of a vehicle body as reflected in a change in the relative distance between a suspension member and a lower surface of the vehicle body, comprising at least two magneto-electric transducer elements which are fixedly mounted on the lower surface of the vehicle body and spaced apart a given distance, a movable magnet disposed in opposing relationship with the transducer elements, and an actuating member connected between the magnet and the suspension member for actuating the magnet in accordance with a change in the relative distance between the suspension member and the vehicle body, a displacement of the magnetic selectively activating or deactivating the transducer elements, thereby producing a signal indicative of the elevation of the vehicle body.

4,290,045
BRAKE SYSTEM WARNING CIRCUIT

Marvin H. Killinger, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 10, 1979, Ser. No. 83,443
Int. Cl.[3] B60T *17/22*
U.S. Cl. 340—52 C 21 Claims



1. A warning circuit for a vehicle including an engine, a brake system, and means for actuating the engine, the brake system having a primary source of brake actuation pressure, an auxiliary source of brake actuation pressure, and relay means for actuating the auxiliary source upon failure of the primary source, the warning circuit comprising:

circuit means coupled to the actuating means and to the relay means for generating a warning signal in response to an open circuit condition of the relay means when the engine is running.

4,290,046
CODED ELECTRICAL SECURITY SYSTEM FOR VEHICLES, SUCH AS AUTOMOBILES

Ovila Chabot, 78, du College St., Pont-Rouge, Prov. of Quebec, Canada (G0A 2X0)

Continuation-in-part of Ser. No. 4,690, Jan. 19, 1979. This application Oct. 5, 1979, Ser. No. 82,375
Int. Cl.[3] G08B *1/08;* B60R *25/10*
U.S. Cl. 340—63 4 Claims

1. A coded electrical security system for a vehicle, such as an automobile, comprising:

(a) a bank of series-connected double-throw toggle switches, each having a through terminal and a phantom terminal and which must be operated in one of two positions following a predetermined code for completing an electrical circuit through the through terminals of all the switches;

(b) means for connecting one terminal of one of the toggle switches to an automobile battery;

(c) at least one safety light mounted externally of said vehicle;

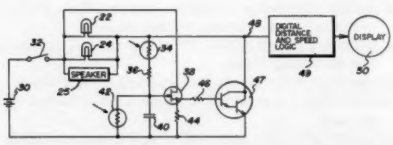
(d) means for connecting one of the terminals of the last toggle switch in the series to said safety light, whereby operation of the toggle switches following the predetermined code will complete the electrical circuit and energize the safety light; and

(e) wherein each safety light is of a lesser voltage than the battery and has an appropriate resistance series connected therewith, whereby if the resistance is bypassed, said safety light will burn out.

4,290,047
LIGHT DETECTION, SIGNALING AND SPEED MEASUREMENT SYSTEM

John S. Latta, Jr., 3100 W. Walnut, Apt. 109, Garland, Tex. 75040

Continuation-in-part of Ser. No. 669,677, Mar. 23, 1976, Pat. No. 4,117,457. This application Aug. 21, 1978, Ser. No. 934,704
Int. Cl.[3] B62J *5/00;* H05B *37/02*
U.S. Cl. 340—134 35 Claims



13. A system for sensing and measuring a variation in light level of a light source having an intensity located at a distance from the system comprising:

a housing having a vertical axis;

first circuit means disposed within said housing for photosensitive detection of variations in the light intensity at

any direction in a horizontal plane perpendicular to said vertical axis of the light source and for generating a signal representative of the incident light on the system;

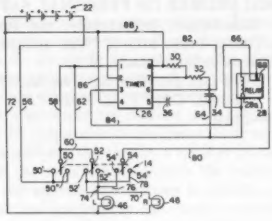
second circuit means for measuring variations in said signal generated by first circuit means as a function of time and for generating an output signal; and

means interconnected to said second circuit means for displaying said output signal generated by said second circuit means to provide an indication of variations in the intensity of the light source as a function of time.

4,290,048
TURN SIGNALLING APPARATUS

David S. Cutlip, and Judyth Cutlip, both of 179 Candlewood Path, Dix Hills, N.Y. 11746

Filed Jun. 5, 1980, Ser. No. 156,836
Int. Cl.³ B62J *3/00*; B60Q *1/34*
U.S. Cl. 340—134 **13 Claims**



1. A vehicle turn signalling apparatus, comprising:

(a) a right-turn signalling lamp;

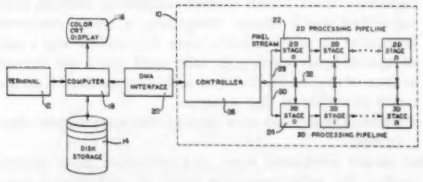
(b) a left-turn signalling lamp; and

(c) means for simultaneously initiating a flashing illumination of either one of said signalling lamps and a steady illumination of the other signalling lamp.

4,290,049
DYNAMIC DATA CORRECTION GENERATOR FOR AN IMAGE ANALYZER SYSTEM

Stanley R. Sternberg; Robert M. Lougheed, and William O. Dargel, all of Ann Arbor, Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Sep. 10, 1979, Ser. No. 73,816
Int. Cl.³ G06K *9/12*
U.S. Cl. 340—146.3 MA **8 Claims**

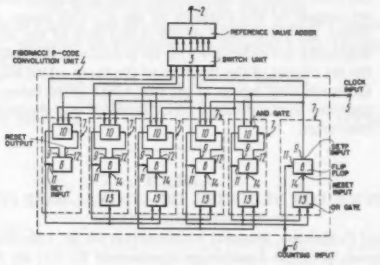


1. In an image analyzer system, the improvement comprising scanner correction circuitry for accomodating wrap-around of digital data signals derived from a scanner having an ambiguity interval less than the true range of values of points in the scene being sensed, said scanner correction circuitry including means for sensing the value of a central data point in a neighborhood of a matrix of points comprised of a central data point and its surrounding points in the matrix, means for adding to the values of all of the data points in the neighborhood a correction value associated with the sensed value of the central data point so that all of the adjusted data points in the neighborhood are uninterrupted by any wrap-around whereby said system may accurately identify the data point in the neighborhood truly having a particular value associated with the scene; and means for removing the correction value from the system output after the said value has been selected.

4,290,050
DIGITAL-ANALOG CONVERTER UTILIZING FIBONACCI SERIES

Alexei P. Stakhov, prospekt Kosmonavtov, 54, kv. 130, Vinnitsa, U.S.S.R.

Filed Sep. 20, 1978, Ser. No. 944,014
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **1 Claim**



1. A digital-analog converter, comprising

a reference value adder having an output functioning as the output of said digital-analog converter and a multidigit input and producing analog values;

a switch unit having a multidigit input and a multidigit output and selecting respective reference values in said reference value adder; and

a Fibonacci p-code convolution unit having a counting input, a clock input and a multidigit output and converting step-by-step the original p-code of a natural number to other code combinations representing that natural number, the multidigit input and the multidigit output of said switch unit being coupled to the multidigit output of said Fibonacci p-code convolution unit and to the multidigit input of said reference value adder, respectively, said Fibonacci p-code convolution unit comprising n stages for converting the bit positions of the original p-code of a natural number, each of said stages corresponding to one of the bit positions of the original p-code, said stages ranging from the lowest order, or zero, bit position, to the highest order, or (n−1)th bit position, which are, respectively, referred to as the ith bit positions, where i=0, 1, 2, . . . (n−1), p and n are each any natural number from 1 to infinity, the value of each of which is a constant or any given embodiment and wherein n is the length of the Fibonacci p-code, each of the stages of said Fibonacci p-code convolution unit corresponding to the bit positions from 1 to n−2 having a flip-flop, an AND gate and an OR gate, all of the AND gates except one having first, second, third, and fourth inputs and an output and said one AND gate having first, second and third inputs and an output and all of the OR gates except one having first and second inputs and an output and said one OR gate having an input and an output, said stage of the low order, zero, bit position having a flip-flop and an OR gate and said stage of the higher order, (n−1)th, bit position having a flip-flop and an AND gate, each of said flip-flops having a reset input, a reset output, a set input and a set output, the set and reset inputs of the flip-flop of said stage of the ith bit position being coupled to the output of the AND gate and the output of the OR gate, respectively, of said stage of the ith bit position, the reset input of the flip-flop of said stage of the low order bit position being coupled to the output of the OR gate of said stage of the low order bit position, the

set output of the flip-flop of said stage of the low order bit position functioning as the counting input of said digital-analog converter, the set input of the flip-flop of said stage of the high order bit position being coupled to the output of the AND gate of said stage of the high order bit position, and the set outputs of a plurality of the flip-flops of all said stages functioning as the multidigit output of said Fibonacci p-code convolution unit, the first and second inputs of the OR gate of each stage corresponding to the bit positions i to n−2 being coupled to the output of the AND gate of the (i+1)th stage and the output of the AND gate of the (i+p+1)th stage, respectively, the first and second inputs of the AND gate of the ith stage corresponding to the bit positions 1 to n−1 being coupled to the reset output of the flip-flop of the same stage and to the set output of the flip-flop of the (i−1)th stage, respectively, the third input of the AND gate of the ith stage, beginning with the (p+1)th bit position being coupled to the set output of the flip-flop of the (i−p−1)th stage, and the remaining inputs of all the AND gates being joined together to constitute a clock input of said digital-analog converter.

4,290,051

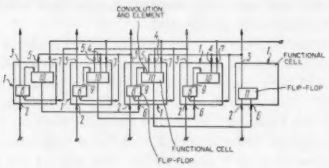
DEVICE FOR REDUCING IRRATIONAL-BASE CODES TO MINIMAL FORM

Alexei P. Stakhov, prospekt Kosmonavtov 54, kv. 130; Andrei A. Kozak, prospekt Leninskogo Komsomola 53, kv. 40; Nikolai A. Solyanichenko, ulitsa Vasilia Porika 30, kv. 108; Ivan V. Kuzmin, Kommunalny pereulok 3, kv. 6, and Alexei D. Azarov, ulitsa Vasilia Porika, 30, kv. 103, all of Vinnitsa, U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,175

Int. Cl.³ H03K *13/24*

U.S. Cl. 340—347 DD **4 Claims**



1. A device for reducing irrational-base codes to a minimal form, comprising:

n identical functional cells;

a Bth functional cell comprising: an information input from which code information is entered; an information output from which code information is read; first and second convolution information inputs respectively receiving information on the state of (B−1)th and (B−p−1)th functional cells and respectfully connected to said information outputs of these functional cells; a convolution signal output at which a convolution signal is formed if the condition for convolution of the code digits for said Bth functional cell is satisfied; a convolution set input receiving a signal which resets said Bth functional cell and connected to said convolution signal output of a (B+p+1)th functional cell; a convolution control input receiving a signal which enables convolution of said Bth functional cell; and an inversion signal input receiving a signal which reverses the state of said Bth functional cell and connected to said information output of said (B−1)th functional cell;

wherein n is the digit capacity of the code, B=1, 2, . . . , (n−1), and p=1;

wherein each of said functional cells, except the functional cell corresponding to the lowest order digit, comprises:

a flip-flop recording and storing information on the Bth digit of the code and having a count input connected to said inversion signal input, a set input connected to said information input, a reset input connected to said convolution set input, a direct output connected to said information output, and an inverting output; and

a convolution AND element evaluating the possibility of performing the operation of convolution of the (B−1)th and (B−p−1)th code digits to the Bth digit and generating a one signal which resets said flip-flop of said (B−p−1)th functional cell if the convolution condition is satisfied, said convolution AND element having a first input connected to said inverting output of said flip-flop, second and third inputs connected to said first and second convolution information inputs, a fourth input connected to said convolution control input, and an output connected to said convolution signal output; and

wherein said functional cell corresponding to the lowest order digit comprises a flip-flop.

4,290,052

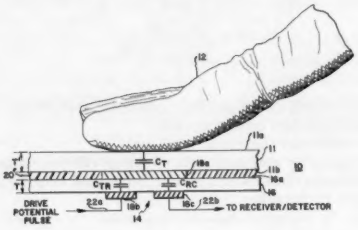
CAPACITIVE TOUCH ENTRY APPARATUS HAVING HIGH DEGREE OF PERSONAL SAFETY

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,287

Int. Cl.³ G06F *3/02*; H01G *7/00*

U.S. Cl. 340—365 C **8 Claims**



1. A touch entry panel activatible upon contact by a user member, comprising:

a relatively thick insulative substrate having a first surface contactable by user personnel, and a second surface opposite said first surface, with both said surfaces being devoid of operational elements of said panel;

a single member having a single insulative layer with a first surface and a second surface opposite said insulative layer first surface, and having all electrodes of at least one capacitive touch sensor formed completely thereon; each capacitive touch sensor comprising a touch electrode fabricated on said insulative layer first surface and a pair of spaced-apart electrodes fabricated upon the second surface of said insulative layer and in registration with the touch electrode of that sensor;

a terminal associated with each of said spaced-apart electrodes;

lead means fabricated upon said insulative layer second surface for interconnecting each of said spaced-apart electrodes and its associated terminal;

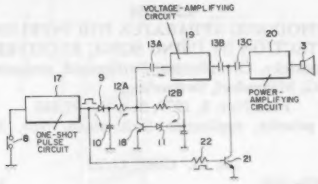
conductive guard means disposed upon said insulative layer first surface and positioned for shielding the lead means of at least one of said at least one capacitive touch sensor from capacitive effects when said substrate first surface is contacted by said user member; and

means for fastening said member first surface adjacent to said substrate second surface; said substrate being formed of a material having a dielectric constant sufficiently high enough to cause one of said at least one capacitance touch sensor to be activitated when the user member contacts a portion of the substrate first surface opposite the touch electrode of the capacitive touch sensor to be activated.

4,290,053
SOUND EFFECTS PRODUCER

Kuniichi Nemoto, 2357, Jinkaiji-machi, Chofu-shi, Tokyo, Japan

Filed Jun. 28, 1978, Ser. No. 919,796
Claims priority, application Japan, Feb. 22, 1978, 53/19300
Int. Cl.[3] G08B *3/10*
U.S. Cl. 340—384 E 2 Claims

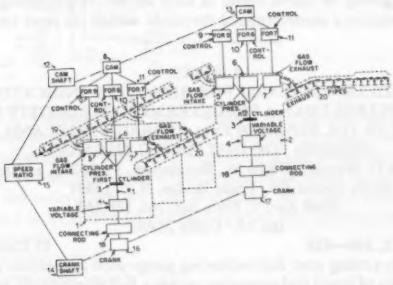


1. A sound effects producer comprising a Zener diode semiconductor element, an inverse voltage impressing means for impressing to the Zener diode semiconductor element inverse voltage sufficient to generate output having a random noise component, as an alternating current component from an output side of the semiconductor element, an amplification circuit connected to the output side of the Zener diode semiconductor element for amplifying the output, a speaker connected to the output side of the amplification circuit for converting output amplified by the amplification circuit to audible sound, and a control circuit for controlling the output wave-form of the inverse voltage impressing means, the control circuit comprising an on-off control circuit connected between the Zener diode semiconductor element and the power source of the inverse voltage impressing means, an attenuator for causing attenuation of the output signal from the Zener diode semiconductor element, and a switching circuit to ground the output signal from the Zener diode semiconductor element while the on-off control switch is in the on position.

4,290,054
ELECTRICAL APPARATUS AND METHOD FOR ELECTRICALLY SIMULATING A NOISE

Michel Magnani, Templeuve, and Michel Moulin, Nieppe, both of France, assignors to S.A. Andre Boet, France

Continuation-in-part of Ser. No. 883,844, Mar. 6, 1978. This application Dec. 12, 1979, Ser. No. 103,063
Claims priority, application France, Mar. 8, 1977, 77 07573
Int. Cl.[3] G09B *9/02;* G08B *3/10*
U.S. Cl. 340—384 E 9 Claims

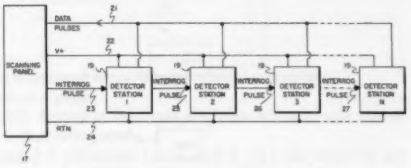


1. Electrical apparatus for simulating noise resulting from the thermodynamic expansion of a gas inside a chamber the volume of which is varied and from the flow of gas between the chamber and the exterior thereof, comprising a circuit for simulating the said expansion, said circuit comprising in series a capacitor of fixed capacitance and means for varying with respect to time the potential at at least one of the terminals of said capacitor, said variation of potential depending on the variation of the volume of said chamber with respect to time and on the nature of said expansion, and further comprising an exhaust circuit connected to said expansion simulating circuit, said exhaust circuit comprising in series a fixed impedance and a semi-conducting circuit, said semi-conducting circuit comprising means for varying its internal impedance with respect to time, said variation in internal impedance depending on the variation with respect to time of the mass flow of gas and of the type of flow.

4,290,055
SCANNING CONTROL SYSTEM

Douglas E. Furney, and Michael J. Muldrey, both of Lakewood, Colo., assignors to Technical Development LTD, Hamilton, Bermuda

Filed Dec. 5, 1979, Ser. No. 100,574
Int. Cl.[3] G08B *19/00*
U.S. Cl. 340—518 31 Claims



1. A condition monitoring system, comprising:

interrogation means providing an interrogation pulse output;

a plurality of detecting means adapted to monitor a predetermined variable condition, each of said detecting means including receiving means for receiving interrogation pulses with said receiving means of a first of said detecting means being connected with said interrogation means to receive said interrogation pulse output therefrom and responsive thereto providing an interrogation pulse output, each of said detecting means being connected in series with one another so that said receiving means of each of said detecting means receives an interrogation pulse output from the immediately preceeding one of said detecting means with each of said detecting means, responsive to receipt of said interrogation pulse output coupled thereto, providing a data pulse output having a predetermined characteristic if said monitored variable condition is in a preselected state, and each said data pulse output being on a common output conductor with each detecting means providing said data pulse output at timewise spaced intervals so that a train of data pulses is coupled from said detecting means; and

pulse processing means connected with said common output conductor to receive said train of data pulses and responsive thereto providing an indication of the state of said detecting means.

4,290,056
PROTECTIVE SYSTEM

Vincent Y. S. Chow, Hanover Park, Ill., assignor to Ellsworth, Chow & Murphy, Inc., Palo Alto, Calif.

Filed Jul. 5, 1979, Ser. No. 54,859
Int. Cl.[3] G08B *25/00*
U.S. Cl. 340—538 21 Claims

1. A protective system having at least two remote stations and a master receiver all connected by a common AC power line, said protective system comprising:

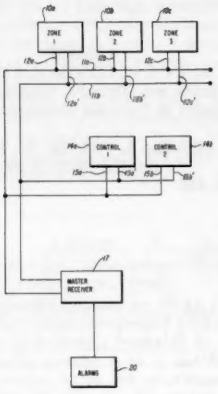
(a) at least one monitoring means connected to each remote station for detecting an alarm or normal condition at said monitoring means;

(b) timing means;

(c) signal generating means within each remote station responsive to said monitoring means and said timing means for producing and transmitting on said AC power line alarm and normal data transmission signals representing alarm or normal conditions;

(d) each of said alarm and normal data transmission signals comprising a data pulse of greater duration than one cycle of the AC power wave form wherein said data pulse is not synced to or dependent upon said AC power wave form;

(e) said signal generating means transmitting said data pulse



after a time delay established by said timing means unique for each remote station;

(f) transmission sensing means within said master receiver for detecting alarm or normal data transmission from each remote station;

(g) control signal generating means within said master receiver responsive to said master signal sensing means for producing control data transmission signals; and

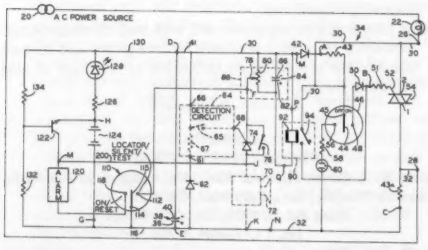
(h) signal sensing means within each remote station responsive to data transmissions from each remote station and from said master receiver.

4,290,057

SEQUENTIAL POWER DISTRIBUTION CIRCUIT

Webster B. Knight, 2320 Abbey Dr., Apt. #6, Fort Wayne, Ind. 46815

Filed Sep. 25, 1978, Ser. No. 945,463
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—539 **17 Claims**



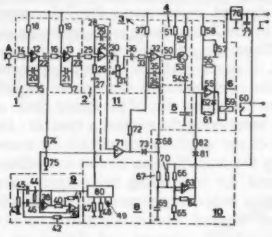
10. A power distribution system adaptable to replace an electrical switch in a circuit having an electrical power source and an illuminating load coupled in power receiving relation to said source and controllable through said switch, said load having a predetermined operating power capacity and decoupled from the power source by switch removal from said source comprising first means for providing an alarm circuit in switch replaceable relation to said load and in series with said load and power source wherein said alarm circuit receives operating power through said load; said first means having an alarm detection condition and a non-alarm detection condition; and second means coupled to said power source and illuminating load for providing an alarm when one of said power source and primary load become inoperative.

4,290,058

METHOD AND APPARATUS FOR INTRUSION DETECTION BY USING SONIC RECEIVERS

Gustav Bystricky, Oberdürnten, Switzerland, assignor to Cerberus AG, Männedorf, Switzerland

Filed Nov. 5, 1979, Ser. No. 91,410
Claims priority, application Switzerland, Nov. 30, 1978, 12243/78
Int. Cl.³ G08B *13/22*
U.S. Cl. 340—566 **14 Claims**



1. A method for detecting an intrusion, comprising the steps of:

obtaining signals delivered by a sonic receiver mounted at the object to be protected;

mixing the obtained signals with a carrier frequency whose frequency periodically and continuously passes within a given time duration through a predetermined frequency range;

filtering the mixed signal in a narrow band frequency range;

upon occurrence of a filtered signal activating a timing circuit having a predetermined time duration;

integrating the filtered signal;

resetting the result of the integrated filtered signal whenever the filtered signals are interrupted for at least said time duration of the timing circuit;

said time duration at most being equal to the time duration of a frequency throughpass; and

triggering an alarm signal as soon as the integrated signal reaches a predetermined threshold within the reset time.

4,290,059

LIQUID LEVEL ALARM FOR REMOTELY INDICATING WHEN LESS THAN A PREDETERMINED QUANTITY OF FUEL OIL REMAINS IN A STORAGE TANK AND METHOD FOR INSTALLING THE SAME

Walter O. Noyes, 308 Elm St., Bennington, Vt. 05201, and John M. Helft, Center Rd., Eagle Bridge, N.Y. 12057

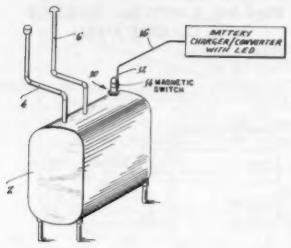
Filed Apr. 7, 1980, Ser. No. 138,163
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—624 **12 Claims**

1. In a rising stem fuel indicating gauge used to measure the quantity of liquid fuel remaining within a fuel storage tank, said indicating gauge being of the type including a tube, a level-indicating element on a shaft within said tube, and indicating markings on said tube for determining the quantity of fuel within said fuel storage tank corresponding to the level of said indicating element in said tube;

the improvement comprising:

a magnetic element carried on said level-indicating element;

a magnetically actuated switch mounted to said tube, said switch being selected so that it is magnetically actuated by said magnetic element carried on said level indicating element when said magnetic element descends in said tube to less than a predetermined distance away from said switch, said switch being mounted on said tube in such position that actuation of said switch by said magnetic



element indicates that no more than a predetermined quantity of fuel remains within said fuel storage tank; and

an alarm coupled to said switch for actuation thereof upon the actuation of said switch;

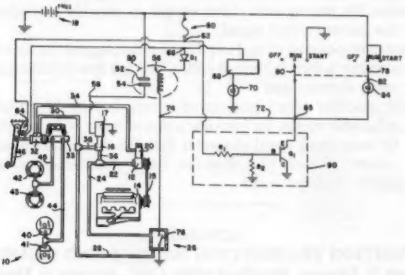
whereby actuation of said alarm provides an indication that no more than said predetermined quantity of fuel remains within said fuel storage tank.

4,290,060

BRAKE FUSE WARNING CIRCUIT

Dewey W. Eppley, Nappanee, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 10, 1979, Ser. No. 83,441
Int. Cl.³ B60T *17/22*
U.S. Cl. 340—638 **10 Claims**



1. A warning circuit for a vehicle brake system having a battery-powered source of brake actuation pressure, having electrical control circuitry for controlling and monitoring the brake system, and having a fuse connected between the battery and the control circuitry for protecting the control circuitry from a short circuit to ground condition, the warning circuit comprising:

a warning device;

a controlled switch;

first means for coupling the controlled switch with the warning device; and

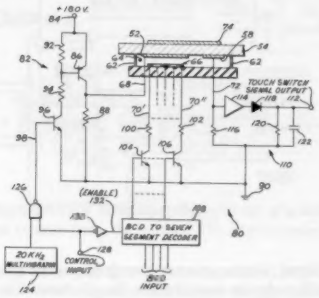
second means for coupling the controlled switch with the vehicle battery via the fuse, the controlled switch actuating the warning device in response to an open circuit condition of the fuse.

4,290,061

ELECTRICALLY INTEGRATED TOUCH INPUT AND OUTPUT DISPLAY SYSTEM

Juan de J. Serrano, Seymour, Conn., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 23, 1979, Ser. No. 69,001
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—712 **30 Claims**



1. An integrated entry/display system comprising:

a dielectric panel;

a display having at least one electrode adjacent one side of said dielectric panel;

a capacitive attenuator touch switch rear pad adjacent the one side of said dielectric panel and electrically insulated from said one display electrode;

a capacitive attenuator touch switch front pad adjacent the other side of said dielectric panel and arranged for capacitive coupling through said panel with both said one display electrode and said touch switch rear pad; and

circuitry for operating said display by applying a suitable signal to said one display electrode; and for operating said one display electrode, said touch switch rear pad and said touch switch front pad together as a capacitive attenuator touch switch by applying an effectively AC exciting voltage to one of said one display electrode and said touch switch rear pad and sensing the resultant signal capacitively coupled to the other of said one display electrode and said touch switch rear pad to detect a decrease in the coupled signal when said touch switch front pad is touched.

4,290,062

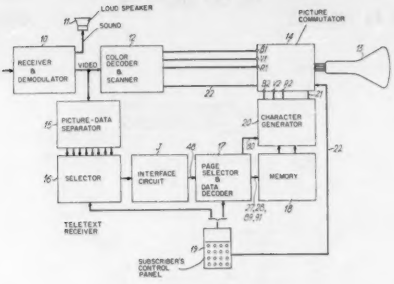
SYSTEM FOR DIGITAL TRANSMISSION AND TEXT DISPLAY

Bernard Marti, Noyal-sur-Vilaine; Alain Poignet; Jean-Yves Savary, both of Rennes, and Roger Brusq, Betton, all of France, assignors to Etablissement Public de Diffusion dit Telediffusion de France, Montrouge, France

Filed Feb. 28, 1979, Ser. No. 15,959
Claims priority, application France, Mar. 10, 1978, 78 07551
Int. Cl.³ G06F *3/14*
U.S. Cl. 340—721 **13 Claims**

1. A system for transmission and display of text material on a television screen, wherein the transmitting television station broadcasts data for such displays in the form of data packets sent out over several channels, the packets from the different channels being adapted to be time multiplexed, a series of packets from any one channel constituting a magazine made up of several pages, the packets relative to any one page being transmitted without being multiplexed with the packets from another page one page including an order row of data which is purely operational data that is not used for display, and character shape format control means for use in said system, said character shape format means comprising: a plurality of shape

memory means for recording the character shapes transmitted by the system, said one of said pages of transmitted data containing exclusively data relating to the shapes of alphabet characters on the alphabet page which is not for display means for switching the subsequent data of that alphabet page toward



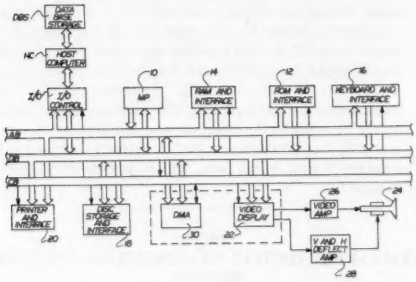
a writing circuit, means associated with one of the shape memory means in order to record there the character shape data, and character generator means responsive to said recorded character shape data for generating alphabetical character of a shape selected from said page which is not for display.

4,290,063

VIDEO DISPLAY TERMINAL HAVING MEANS FOR ALTERING DATA WORDS

Elden D. Traster, Garland, Tex., assignor to Harris Data Communications, Inc., Dallas, Tex.

Filed Aug. 3, 1979, Ser. No. 63,528
Int. Cl.[3] G06F *3/153*
U.S. Cl. 340—723 **7 Claims**



1. A video display system, comprising:

a data source for providing a data stream comprised of a plurality of multi-bit coded data words, each said data word being comprised of N bits and having at least one dedicated bit position for normally indicating whether the data word is representative of a character to be displayed or a non-character, whereby a maximum of N−1 bits can be used to provide character information;

video display means for displaying images of characters represented by character data words;

character generator means for receiving said data words for controlling said video display means in dependence upon non-character data words for displaying images of said character data words; and,

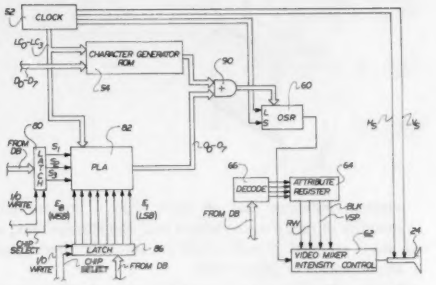
conversion means interposed between said data source and said character generator means for converting the bit paiterns of at least some of said data words normally representing said non-character data words into that representing character data words to thereby increase the number of said data words available to represent characters to be displayed.

4,290,064

VIDEO DISPLAY OF IMAGES WITH IMPROVED VIDEO ENHANCEMENTS THERETO

Elden D. Traster, Garland, Tex., assignor to Harris Data Communications, Inc., Dallas, Tex.

Filed Aug. 3, 1979, Ser. No. 63,529
Int. Cl.[3] G06F *3/153*
U.S. Cl. 340—723 **5 Claims**



1. A video display system for displaying dot pattern images of data characters on a display screen with dot pattern modifications to the video characteristics thereof and comprising:

means for providing a data stream including a plurality of coded character words each representing a dot pattern image to be displayed and at least one coded modifier word each representing one or more of a plurality of N dot pattern modifiers;

means responsive to each said coded character word for providing dot pattern video signals for forming the dot pattern image represented thereby,

means responsive to each said coded modifier word for providing dot pattern modifier video signals;

means for mixing said video signals to provide a combined dot pattern video signal;

means responsive to said combined video signals for forming a video image with said video dot pattern modifications made thereto; and

said modifier word responsive means having N different selectable modes for providing one or more of N modifiers for modifying a said character with the dot pattern modification for each said modifier being determined by said coded modifier word.

4,290,065

POSITION TRANSDUCING METHOD AND MEANS

Joseph P. Gleason, Woodland Hills, Calif., assignor to Thomas P. Sullivan, Los Angeles, Calif., a part interest

Filed Apr. 10, 1980, Ser. No. 139,092
Int. Cl.[3] G08C *25/02, 19/10, 19/04*
U.S. Cl. 340—870.43 **6 Claims**

1. A method of converting a physical position into an electrical signal including the steps of:

(a) connecting opposite ends of an enlogated resistance member of given length across a fixed voltage source to provide a voltage gradient from one end to the other;

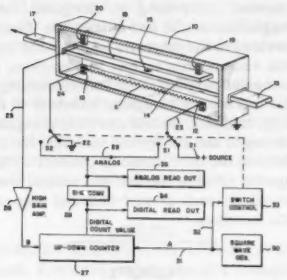
(b) moving an aperture along said member a distance constituting a function of said physical position;

(c) providing an analog voltage constituting a function of a digital count value;

(d) switching the connection of said member back and forth between said fixed voltage source and said analog voltage at a given frequency to provide a comparison of the value of the voltage at the physical position of the aperture and

the value of the analog voltage each cycle of said given frequency; and

(e) increasing the digital count value at each frequency cycle that the voltage value due to the voltage gradient is



greater than the analog voltage and decreasing the digital count value each frequency cycle that said voltage value due to said voltage gradient is less than said analog voltage so that said digital count value will always reflect a value determined by the position of said aperture.

4,290,066

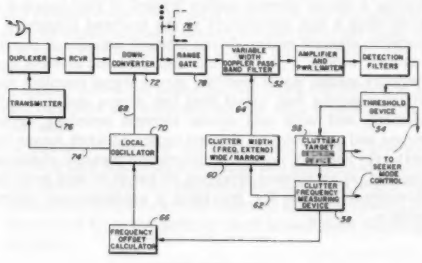
HIGH SPEED ADAPTIVE CLUTTER FILTER

Walker Butler, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 12, 1979, Ser. No. 84,265

Int. Cl.³ G01S *7/28*

U.S. Cl. 343—17.1 R **4 Claims**



1. In an airborne coherent pulsed Doppler radar system having a receiver comprising a local oscillator, a method of suppressing clutter in order to put nearby desired targets within a useful dynamic range of the radar system, comprising the steps of:

(a) sensing a presence of clutter in a specified range interval;

(b) measuring a center frequency of said clutter during the radar look time;

(c) moving the local oscillator output frequency by an amount equal to said center frequency of said clutter before the onset of the next look time of the radar;

(d) sensing for a target presence within said range interval; and

(e) repeating steps (a), (b), (c) and (d) in sequential range intervals until a target is sensed, with each range interval having a different, adaptive clutter notch.

4,290,067

RADIANT ENERGY PROFILOMETER

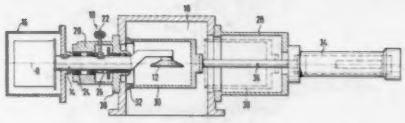
Edouard Legille, and Victor Kremer, both of Luxembourg, Luxembourg, assignors to Paul Wurth, S.A., Luxembourg, Luxembourg

Filed Dec. 10, 1979, Ser. No. 102,428

Claims priority, application Luxembourg, Dec. 12, 1978, 80645

Int. Cl.³ G01S *13/08*

U.S. Cl. 343—12 R **23 Claims**



1. In apparatus for measuring the contour of a surface from a location remote from the surface, the improvement comprising:

means for transmitting radiant energy to the surface of interest and receiving the transmitted energy reflected from the surface;

support means for said transmitting and receiving means; and

chamber defining means movable relative to said support means between a first position commensurate with measurement of the surface and a second position wherein the transmitting and receiving means is hermetically isolated from the surface within a chamber.

4,290,068

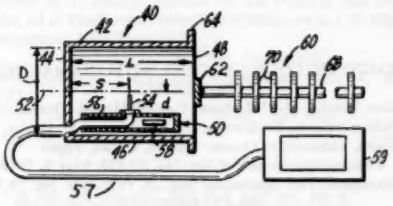
MICROWAVE TELEVISION SYSTEM

Richard D. Bogner, 4 Hunters La., Roslyn, N.Y. 11576

Filed Dec. 14, 1979, Ser. No. 103,612

Int. Cl.³ H01Q *13/28*

U.S. Cl. 343—702 **14 Claims**

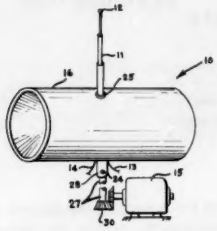


1. A microwave receiving apparatus comprising a probe excited, waveguide, electronic circuit means contained in said waveguide and means for mounting said waveguide onto a support; said waveguide comprising: a metallic container having an elongated axis and including at least a back wall, side walls, and and open mouth which defines an internal cavity; a metal structure positioned within the container and extending in a direction between the back wall and the mouth of the container, spaced from the side walls of the container and contained within at most one half of the volume of the cavity, and a probe extending from the metal structure into the remaining portion of the container for excitation of the waveguide; wherein the diameter D of the waveguide is between $\lambda/2$ and λ, the probe is spaced from the back wall a distance S of between $\lambda/8$ and $\lambda/2$, λ being the wavelength of the transmission energy and wherein the metal structure extends from the back wall toward the mouth a distance in the range between S and the length L of the waveguide.

4,290,069
DIRECTIONAL ANTENNA FOR LONG RANGE T.V. SIGNAL RECEPTION

Philip H. Duda, 20C Scott Cir., Bedford, Mass. 01730

Filed Mar. 25, 1980, Ser. No. 133,716
Int. Cl.³ H01Q *21/29*
U.S. Cl. 343—722 **9 Claims**



1. In combination with a television receiver having VHF and UHF antenna leads, a directional antenna for long range television signal reception, said directional antenna comprising

a cylindrical r.f. coil,

a monopole antenna center tapped to said r.f. coil and extending perpendicularly therefrom, one end of said r.f. coil being connected to said UHF antenna lead and the other end being connected to the base of said monopole antenna,

first and second truncated cones of conductive material, said first cone being mechanically connected by its vertex to one end of said r.f. coil and said second cone being mechanically connected by its vertex to the other end of said cone, said r.f. coil and said cones constituting a bi-conical antenna structure,

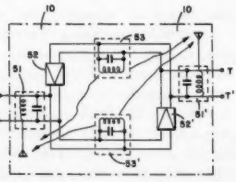
a support structure connecting said truncated cones, said VHF antenna lead being connected to said support structure and to said first and second truncated cones, and

means engaged to said support structure for positioning said bi-conical antenna structure in a horizontal position.

4,290,070
MAGNETIC LOOP ANTENNA WITH DIAMAGNETIC PROPERTIES

Osamu Tanaka, 16-37, 5-chome Yoshida Higashi Osaka, Osaka; Nobuo Nakano, Kashiwara, and Toyoaki Fukui, Osaka, all of Japan, assignors to Osamu Tanaka, Osaka, Japan

Continuation-in-part of Ser. No. 37,939, May 9, 1979, abandoned. This application Sep. 25, 1979, Ser. No. 78,761
Int. Cl.³ G09F *9/00*
U.S. Cl. 343—788 **4 Claims**



1. An antenna comprising:

a first elongated magnetic antenna member having a first magnetic pole orientation, said first elongated magnetic member comprising an elongated member made from magnetic material and at least one diamagnetic portion provided in the magnetic material and separating the magnetic material into at least two portions;

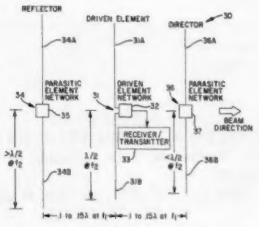
a second elongated antenna member having a second magnetic pole orientation opposite to the first magnetic pole orientation and provided adjacent and parallel to the first elongated magnetic member, said second elongated magnetic member comprising an elongated member made from magnetic material and at least one diamagnetic portion provided in the magnetic material and separating the magnetic material into at least two portions; p1 a pair of third elongated magnetic members connecting the ends of said first and second elongated members to form a magnetic loop, said first, second and third elongated members being arranged and configured such that the lines of magnetic force in the third members connect with the lines of the magnetic force in the first and second members; and

a coil wound on each of said first and second elongated magnetic members.

4,290,071
MULTI-BAND DIRECTIONAL ANTENNA

Richard C. Fenwick, Dallas, Tex., assignor to Electrospace Systems, Inc., Richardson, Tex.

Filed Dec. 23, 1977, Ser. No. 863,619
Int. Cl.³ H01Q *19/30*
U.S. Cl. 343—819 **32 Claims**



1. In a multi-band multi-element directional antenna array having a driven element means formed of two opposed sections each a half wavelength at the midband frequency and parasitic element means: driven element impedance matching network means; a parasitic element; parasitic element center network means; signal feed line means; signal coupling means interconnecting said signal feed line means and said driven element; and with said driven element matching network means and said parasitic element center network means being networks enabling respective driven and parasitic elements to respond, as an antenna array, on all bands of said multi-band directional antenna for providing a unidirectional radiation pattern.

4,290,072
OPAQUE JET INK PRINTING METHOD AND COMPOSITION

Ishwar R. Mansukhani, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jan. 28, 1980, Ser. No. 115,916
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **41 Claims**

1. A process for opaque jet printing comprising:

providing a uniform printable substrate;

providing supply of jet ink comprising from 2% to 60% by weight of a resin or mixture thereof, from about 40% to about 90% of a solvent selected from the group consisting of aliphatic alcohols, ketones, hydrocarbons, and mixtures thereof, up to about 5% of an electrolyte, up to about 10% of a dye or other coloring material, and up to about 40% of a slow evaporating solvent selected from the group consisting of substituted and unsubstituted heterocyclic

compounds having 5 or 6 membered rings and from 1 to 3 oxygen or nitrogen atoms in the ring, at least one of said dye and said electrolyte being present in said ink, said ink exhibiting a viscosity of from 0.5 to 25 cp. at 25° C. and having a resistivity of up to 10,000 ohm-cm.;

forming a jet of discrete droplets of said ink;

directing said jet toward said substrate;

modulating the density of said jet by applying an electric field thereto in accordance with information to be recorded;

printing said information on said substrate;

applying a coating of an opacifying solvent, before the solvents in the ink have evaporated, the solvents in the ink being miscible in the opacifying solvent, and the resin being immiscible in the opacifying solvent; and

drying the thus opacified printed information.

4,290,073

INK-JET RECORDING APPARATUS

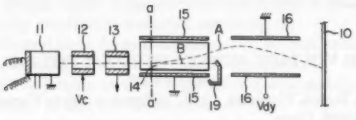
Koichiro Jinnai, Kawasaki, and Kyuhachiro Iwasaki, Fujisawa, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1979, Ser. No. 76,000

Claims priority, application Japan, Sep. 25, 1978, 53/116493

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **3 Claims**



1. An ink-jet recording apparatus characterized by the provision of

(a) an ink head or manifold from which the ink jet is issued,

(b) a charge electrode for imparting a charge to the selected ink drop broken off from said ink jet in response to a video signal,

(c) a first deflection means for deflecting the charged ink drop in a direction which may be resolved into two mutually perpendicular component directions, one being parallel with a main scanning direction while the other being in the direction perpendicular to said main scanning direction,

(d) a second deflection means for cancelling the deflection in said direction perpendicular to said main scanning direction and

(e) a gutter for trapping the unused ink drops interposed between said first deflection means and said second deflection means in front of a recording medium upon which the charged ink drops strike and disposed at a level upward or downward from the printing level in said main scanning direction.

4,290,074

INK DROP GENERATOR FOR INK JET PRINTER

Gerard Royer, Saint-Denis, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

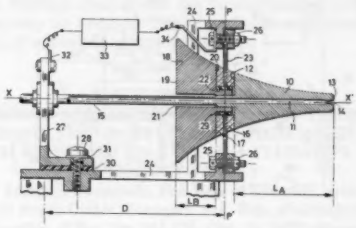
Filed Nov. 21, 1979, Ser. No. 96,527

Claims priority, application France, Dec. 29, 1978, 78 36984

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **20 Claims**

1. A drop generator for use in ink-jet printers, comprising a mechanical vibrations amplifier having two ends, one end of which is adapted to be vibrated and the other end adapted to have ink emitted therefrom, said amplifier including a passage extending between its two ends, and further including an ink supply tube connected to the said passage on the side of said one end of the amplifier, an electromechanical converter device connected at said one end of said amplifier for vibrating said one end to cause ink emitted from the other end to break up into drops at a point close to said other end, means for electrically exciting said converter device to impart a vibratory movement to said amplifier, a compensating block attached to the said converter device and arranged so as to set up in the said converter device a nodal vibration zone, said compensating block including an aperture for the passage of said ink supply tube, said tube having parts situated outside said



nodal zone, the transverse dimensions of said aperture being greater than those of the tube such that the compensating block is maintained out of contact with said those parts of the tube situated outside said nodal zone, and attachment means for holding the drop generator in position on the ink jet printer, said attachment means including a first attachment member having a part in contact with said generator, said part being situated in said nodal vibration zone.

4,290,075

OPTICAL RECORDING DEVICE HAVING SEVERAL ABLATIVE RECORDING LAYERS

Bernardus A. J. Jacobs; Adriaan W. De Poorter, and Pieter Zalm, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 16, 1979, Ser. No. 58,213

Claims priority, application Netherlands, Apr. 2, 1979, 7902542

Int. Cl.³ G01D *15/34;* B32B *7/00, 9/04*

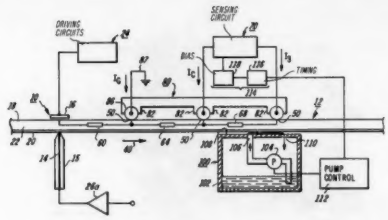
U.S. Cl. 430—270 **11 Claims**

1. A device for the optical recording of information comprising a substrate plate having on at least one side an ablative recording layer which locally melts and forms holes as a result of exposure to laser light modulated in accordance with the information to be written, characterized in that on its surface remote from the substrate the ablative recording layer has a second ablative recording layer having a higher surface energy than the first recording layer, in which during operation of the device both recording layers melt and form liquid regions in the places exposed to the laser light and furthermore as a result of mixing of the recording layers in the liquid regions, a leap in the surface energy occurs at the circumferential edge thereof so that the molten recording material is drawn to the circumferential edge, wets the solid surface of the second recording layer and a hole is formed.

4,290,076
COMPENSATORY MEANS IMPROVING THE OPERATION OF ELECTROSTATIC PRINTERS

Keith E. McFarland, Woodside, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1979, Ser. No. 22,029
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—154 **10 Claims**

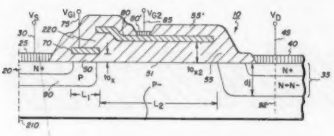


1. In an electrostatic printer of the type having a recording station and a development station, said recording station including electrode means for forming a latent electrostatic image on a recording medium moving through said recording station and thence through said development station, a portion of said recording medium being conductive, a potential above ground maintained at said electrode means during nonprinting periods, said potential being below image forming potentials, all of said potentials establishing a current in said medium conductive portion during printing and nonprinting periods, circuit means provided at said development station to compensate for the effects of said current in said recording medium, the input of said circuit means connected to sense the current in said medium at said development station and the output of said circuit means connected to engage said medium at the upstream side of said development station to nullify said current.

4,290,077
HIGH VOLTAGE MOSFET WITH INTER-DEVICE ISOLATION STRUCTURE

Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1979, Ser. No. 43,851
Int. Cl.[3] H01L *27/02*
U.S. Cl. 357—41 **46 Claims**



1. A high voltage MOSFET device on a substrate for use in a monolithic integrated array comprising:

(a) first means introduced in the substrate for operation as a drain area, second means introduced in the substrate adjacent to said first means for operation as a source area, third means introduced in the substrate between said first and second means for operation as a channel area, and fourth means introduced in the substrate between said first and third means for operation as a drift area;

(b) control gate means embedded in a first layer of relatively thin oxide disposed over said third means for on-off control of voltage as between said first and second means;

(c) field plate means embedded in a second layer of relatively thick oxide disposed over said fourth means for controlling field inversion relative to said first and second means, and for controllably increasing the breakdown voltage as between said control gate means and said first means;

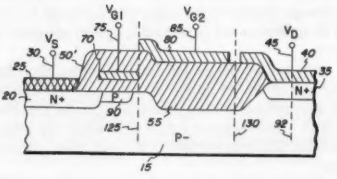
(d) said first means is operative to function as the common axis for said second, third, fourth, control gate and field plate means which are relatively concentric thereto for interdevice high-voltage isolation; and

(e) high voltage lines means disposed on a dielectric oxide which in turn is operative to be placed on a relatively lightly doped implant in the substrate, the relatively lightly doped implant is interposed at predetermined spatial offsets between relatively heavily doped areas in the substrate for operative connection as between said first means and said field plate means for field isolation relative to the device.

4,290,078
HIGH VOLTAGE MOSFET WITHOUT FIELD PLATE STRUCTURE

Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1979, Ser. No. 43,852
Int. Cl.[3] H01L *27/02*
U.S. Cl. 357—41 **24 Claims**



1. A high voltage metal oxide semiconductor FET structure having an integrated monolithic circuit on a substrate with a closed geometry configuration including a drain area having a relative center axis introduced in the substrate, a source area introduced in the substrate relatively adjacent to the drain area, a channel area introduced in the substrate between the source area and the drain area, and a drift area introduced in the substrate between the channel area and the drain area comprising:

(a) first oxide means relatively disposed as a relatively thick layer over the drift area for use as a field dielectric;

(b) second oxide means disposed as a relatively thin layer over the channel area for use as a channel dielectric;

(c) gate electrode means relatively disposed over said second oxide means and spaced from the drain area for controlling the potential and for turning the current on and off as between the source and drain areas.

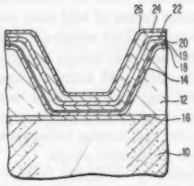
(d) two or more doped area means implanted in the substrate under said first oxide means and offset from said gate electrode means and the drain area having carrier concentrations relatively below degeneracy for stretching out field lines away from the drain area for revention of breakdown at the junction of the drain areas with the substrate.

4,290,079

IMPROVED SOLDER INTERCONNECTION BETWEEN A SEMICONDUCTOR DEVICE AND A SUPPORTING SUBSTRATE

Charles Carpenter, Poughkeepsie; Joseph F. Fugardi, Wappingers Falls; Lawrence V. Gregor, Hopewell Junction; Peter S. Grosewald, Putnam Valley, and Morton D. Reeber, Shrub Oak, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,463
Int. Cl.³ H01L *23/48, 29/46, 29/54*
U.S. Cl. 357—71 3 Claims



3. The ball limiting metallurgy pad structure for a semiconductor device solder bond interconnection that is made from electrically conductive materials consisting of:

an adherent layer formed of chromium that will bond to the passivating layer of a semiconductor device

a relatively thick layer of high thermal conductivity metal bonded to said chromium layer

a barrier layer formed of a metal that protects said high conductivity metal layer by physically preventing any interaction or alloying with overlying layers

a layer that is formed of a solder wettable metal

a surface protective layer

said layer of high thermal conductivity metal, when said pad structure is joined to a substrate with a solder connection, capable of reducing the radial thermal gradient within said interconnection,

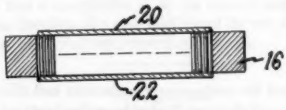
said barrier layer preventing dissolution and interaction of said layer of high thermal conductivity metal with the molten solder during the joining operation.

4,290,080

METHOD OF MAKING A STRAIN BUFFER FOR A SEMICONDUCTOR DEVICE

Robert E. Hysell, Berwyn, Pa., and Francis W. Kalkbrenner, Aurora, Ill., assignors to General Electric Company, Philadelphia, Pa.

Filed Sep. 20, 1979, Ser. No. 77,226
Int. Cl.³ H01L *23/34*
U.S. Cl. 357—81 24 Claims



1. A method of making a thermally and electrically conductive strain buffer for a semiconductor device, the strain buffer including a plurality of individual copper strands, comprising the steps of:

a. providing a plurality of substantially straight strands of copper, said strands being aligned such that their lengths are substantially parallel, each of said strands being of substantially the same length, the respective ends of each of said strands defining a pair of opposing surfaces;

b. closely packing said strands together to remove substantially all interstitial voids between said strands;

c. cleaning said ends of said strands, and then,

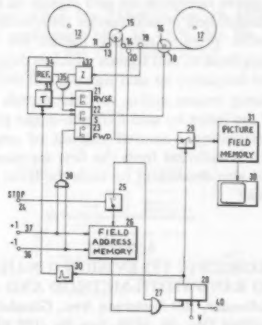
d. depositing by vacuum deposition a layer of highly electrically and thermally conductive metal having a melting point greater than 350° C. on at least one of said opposing surfaces defined by said respective ends of said strands, wherein said deposited metal layer provides sufficient structural integrity to hold said strands together so that the resulting strain buffer can be manipulated with substantially no break-up thereof and with substantially no loss of individual ones of said strands.

4,290,081

METHOD AND APPARATUS FOR STOP FRAME REPRODUCTION IN TELEVISION PICTURE FIELDS EACH RECORDED ON TAPE IN A PLURALITY OF ADJACENT TRACKS

Hubert Foerster, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 841,178, Oct. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 840,026, Oct. 6, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 26,335
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645747
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—4 6 Claims



1. A method of reproducing individual pictures selected by stepwise inspection of a sequence of television picture fields from tape-recorded television signals having picture field addresses corresponding to position on the tape, for critical examination of events recorded in said sequence of fields, comprising the steps of:

storing in an address storage memory the address of a picture field to be repetitively reproduced;

establishing normal pick-up of tape-recorded television signals while keeping track of the positions on the tape of the picture fields successively picked-up;

writing in the signals corresponding to said picture field to be repetitively reproduced into a picture storage memory during normal television signal pick-up of said tape-recorded signals in response to the detection of the tape position corresponding to said stored address;

repetitively reading out nondestructively the signals so stored in said memory;

stopping and reversing the tape movement in response to completion of the writing of said signals corresponding to said picture field into said memory and then automatically stopping the tape again after backing it up to a point from which it can obtain sufficient velocity upon renewed forward movement to pick up and store in said memory a picture field which precedes, by a first predetermined number of picture fields, the picture field last written into said memory, and, concurrently with reversing the tape

movement and stopping it again, modifying the address storage memory to store the address of a picture field preceding or succeeding, selectedly, by said first predetermined number of picture fields, the picture field stored by said corresponding signals in said picture storage memory, the extent of said backing up being determined by a second predetermined number of picture fields exceeding said first predetermined number of picture fields.

4,290,082

NOISE AND CROSS-TALK ELIMINATION IN RECORDING AND REPRODUCING VIDEO SIGNALS

Jun Hirai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 812,329, Jul. 1, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 971,678

Claims priority, application Japan, Jul. 6, 1976, 51/80127; Feb. 28, 1977, 52/21850

Int. Cl.³ H04N *9/493, 5/91*

U.S. Cl. 358—8 **60 Claims**

1. In apparatus for recording signals of varying level extending over a predetermined frequency band, and which comprises modulating means for frequency modulating a carrier with said signals to provide frequency modulated signals, and transducer means receiving said frequency modulated signals and scanning a record medium for recording said frequency modulated signals in successive parallel tracks thereon; signal processing means operative on said signals in advance of the frequency modulation of said carrier therewith and including first non-linear pre-emphasizing means for providing an amount of emphasis to said signals which is dependent on both the level and frequency of said signals, and second non-linear pre-emphasizing means acting on said signals following the emphasis of the latter by said first non-linear pre-emphasising means for providing a second amount of emphasis to said signals which is different from the first mentioned amount of emphasis and also dependent on both the level and frequency of said signals.

4,290,083

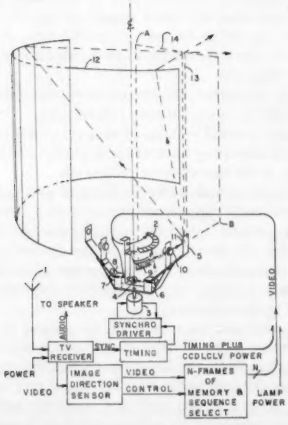
STEREOSCOPIC TELEVISION (UNAIDED) ON STANDARD BANDWIDTH-METHOD AND APPARATUS

Robert B. Collender, 709 Patterson Ave., Glendale, Calif. 91203

Filed Dec. 28, 1979, Ser. No. 107,838

Int. Cl.³ H04M *9/54*

U.S. Cl. 358—88 **2 Claims**



1. A method of stereoscopically reproducing standard television signals for observation by plural observers without the need for visual aids at the eyes of said observers, comprising the steps of:

providing relative lateral motion between television camera and scene;

acquiring a number of sequential television frames or fields on an array of images;

scanning said image array by a scan projector having one or more identical facets;

causing any image of said image array to store a whole television field or frame during the scan interval by any single facet of said scan projector;

causing any image in said image array to advance to the next sequential television field or frame during the period between adjacent facets of said scan projector;

sensing the direction of said relative lateral motion between said camera and scene to assure stereoscopic viewing;

sequentially projecting said array of images onto a semi-specular screen, said scan projector being positioned during projection at successive positions about the arc of a projection circle, said screen being of larger radius compared with said projection circle;

causing said screen to vertically scatter and horizontally reflect light from said screen to intersect on a line essentially tangent to said projection circle;

causing said intersected light to move along said line;

causing said scan projector interval between adjacent facets to be within the period of persistence of vision of observers.

4,290,084

METHOD AND MEANS FOR PRESERVING ORIGINAL CONTINUITY/DISCONTINUITY AMONG SAME COLORED PEL CLUSTERS UPON ARRAY COMPRESSION

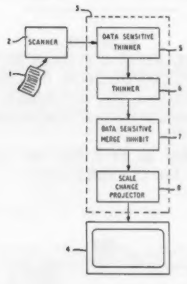
John F. Minshull, Winchester, England, and Pavel Brazdil, Edinburgh, Scotland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 21, 1979, Ser. No. 77,698

Claims priority, application United Kingdom, Oct. 2, 1978, 38998/78

Int. Cl.³ H04N *1/00*

U.S. Cl. 358—260 **13 Claims**



1. A method for preserving continuities and discontinuities among clusters of the same first color valued pels originating in an m×n multicolor valued pel array upon said array being compressed into a smaller p×q size, at least two contiguous first color pels constituting a cluster, the method steps prior to compression include:

detecting a bifurcation between clusters defined by at least one run of consecutive second color valued pels in at least one or more consecutive scan lines through row major order scanning of the m×n array;

upon the detection of a bifurcation, converting first color valued pels lying within a predetermined number of array

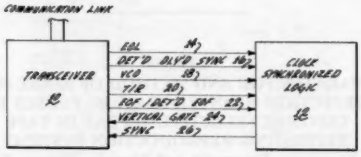
positions contiguous to said detected bifurcation into second color valued pels.

4,290,085

SYNCHRONIZATION SYSTEM FOR VARIABLE LINE LENGTH FACSIMILE TRANSCEIVERS

Carl R. Kolker, San Gabriel, Calif., assignor to Faxon Communications Corporation, Pasadena, Calif.

Filed May 15, 1980, Ser. No. 150,092
Int. Cl.³ H04N 1/36
U.S. Cl. 358—264 **14 Claims**



1. In a raster scan facsimile system utilizing transceivers having means for modulating and demodulating video information on a carrier signal and hving means for creating a raw first signal whose initiation indicates the end of a raster line and whose duration, determined by a predetermined number of cycles of a controllable oscillator, indicates the magnitude of vertical displacement between successive scan lines, successive raw first signals being asynchronous, a combination for better synchronizing a first transceiver functioning in a transmitting mode as a transmitter with a remote transceiver functioning in a receiving mode as a receiver comprising, in each transceiver:

(a) precision oscillator means for creating a first clock signal whose frequency is an integral fraction of said precision oscillator frequency; and a second clock signal whose frequency is an integral fraction of said first clock signal; and

(b) control signal generating means including counting means coupled in the transmitting mode to the controllable oscillator and to said precision oscillator means for generating control signals in response to the raw first signal, the initiation of said control signals being synchronized to said first and second clock signals and the duration of said control signals being related to said first signal, said counting means generating a first operating signal after counting a first predetermined number of first clock signals and a second operating signal after counting a second predetermined number of first clock signals for precise control of the duration of said operating signals; and

(c) whereby the raw first signal is employed only to indicate the approximate start and duration of said control signals in a transceiver when functioning as a transmitter or a received signal when functioning as a receiver, and each scan of the image is controlled by said precision oscillator means for better synchronizing with remote transceivers so that uncertainties as to the time of termination or precise duration of a raw first signal do not affect the generation of control and operating signals.

4,290,086

FIRST GRATE DETECTOR FOR AN OPTICAL SCANNING SYSTEM

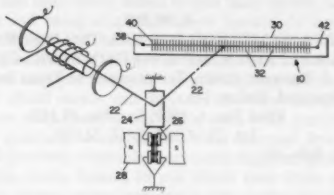
David R. Spencer, Melville, and Leonard Zuckerman, Dix Hills, both of N.Y., assignors to Litton Systems, Inc., Melville, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,776
Int. Cl.³ H04N 1/10
U.S. Cl. 358—293 **11 Claims**

1. An optical scanning system using a beam of electromagnetic energy and a grating for providing scan position information as said beam traces said grating and then retraces back across said grating for the next trace, comprising:

means for generating an output signal as said beam of electromagnetic energy traces each grate in said grating;

means for suppressing said output signal as said beam retraces back across said grating;



means for detecting said output signal above a threshold; and

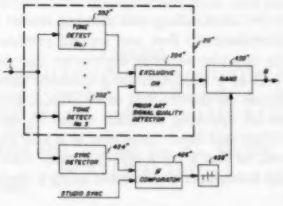
means for detecting a given portion of said output signal above said threshold whereby said portion represents a first grate signal.

4,290,087

COARSE AND FINE CONTROL OF SEGMENTED VIDEO PLAYBACK APPARATUS WITH ANCILLARY RECORDING MEDIUM

James A. Bixby, San Diego, and Robert A. Lentz, Rancho Sante Fe, both of Calif., assignors to Spin Physics, Inc., San Diego, Calif.

Continuation of Ser. No. 916,653, Jun. 19, 1978, abandoned.
This application May 11, 1979, Ser. No. 38,357
Int. Cl.³ H04N 5/795
U.S. Cl. 360—33 **3 Claims**



1. For use with a machine adapted for the playback of segmented field video information recorded on magnetic tape in the form of discrete signal tracks corresponding to the video field segments, each said signal track having recorded therein sync and segment identifier signals and each video field being comprised of N segments per field, said machine having a rotary assembly of magnetic heads adapted to scan said discrete signal tracks and produce signals therefrom, apparatus comprising:

(a) an ancillary magnetic recording medium;

(b) means for slaving said ancillary medium to the motion of said rotary assembly;

(c) magnetic head means for recording N tracks on said ancillary magnetic medium;

(d) means for selectively recording the video field segment signals in respective tracks of said ancillary recording medium; and

(e) means for precluding the recording of signal information on said ancillary recording medium when said signal information has less than a predetermined quality, said means for precluding recording comprising

means for producing a signal having a reference phase,

first means responsive to said identifier signals to produce respective gate signals, and

second means responsive to said sync signals for producing signals corresponding to the phase error between said sync signals and said signal having a reference phase, and

logic means cooperative with said first and second means

for effecting recording on said ancillary medium when one gate signal is exclusively produced coincidentally with a second means output error signal corresponding to a sync error less than a predetermined amount.

4,290,088

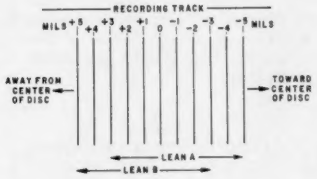
SYSTEM AND METHOD FOR ERASING INFORMATION FROM A FLEXIBLE INFORMATION STORAGE MEDIA

Harold J. Beecroft, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1979, Ser. No. 45,163

Int. Cl.³ G11B *5/47, 21/02*

U.S. Cl. 360—66 **19 Claims**



1. An apparatus for erasing information from selected tracks of a flexible information storage media in an information storage system having a single magnetic head transducer, said apparatus comprising:

(a) means for moving said head transducer along said media and for maintaining said head transducer in a predetermined position relative to the center line of a selected track;

(b) means for controlling said moving means to move said head transducer to first and second predetermined positions on opposite sides of the center line of the selected track and at a predetermined distance therefrom when information on the track is to be erased; and

(c) means for applying an erase signal to said head transducer when said head transducer is in said first and second positions, so that a track width greater than the width of the head transducer is eraseable using a single head transducer.

4,290,089

MAGNETIC-TAPE CASSETTE WITH TAPE COUNTING ROLLER

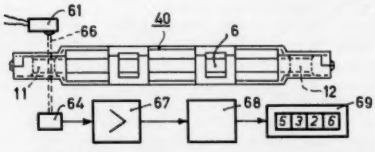
Matheus D. Lavaleije, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 965,830

Claims priority, application Netherlands, Dec. 12, 1977, 7713709

Int. Cl.³ G11B *15/18, 15/48*

U.S. Cl. 360—72.1 **3 Claims**



1. A magnetic-tape cassette comprising a housing, first and second winding hubs accommodated in the housing, a length of magnetic tape having a first end connected to the first winding hub and a second end connected to the second winding hub and arranged so that the tape can be wound back and forth between said hubs, and a tape guide roller arranged interiorly of said housing for guiding the magnetic tape being wound between said hubs, said roller being rotatable about an axis of rotation by the motion of the magnetic tape, and

the improvement wherein said roller includes means for periodically varying the reflection or transmission of a radition beam impinging on the roller, responsive to rotation of the roller proportional to the transport of tape between said hubs, and

the cassette housing comprises radiation transmitting parts arranged to allow passage of a radiation beam into and from the interior of the cassette for cooperation with said roller means.

4,290,090

APPARATUS FOR AND METHOD OF NOISE-FREE DETECTION OF INTER-FEATURE PAUSES TO CONTROL SELECTIVE REPLAY IN TAPE RECORDING/REPRODUCTION SYSTEMS

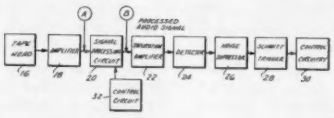
Ryuji Yamamoto, Tonemachi, and Kiyotaka Ohsawa, Kanamachi, both of Japan, assignors to Soundesign Corporation, Jersey City, N.J.

Filed Mar. 25, 1980, Ser. No. 133,821

Claims priority, application Japan, Mar. 28, 1979, 54-39237[U]

Int. Cl.³ G11B *15/16, 15/52, 19/10*

U.S. Cl. 360—72.1 **10 Claims**



1. In a recording/reproduction system for selectively replaying features recorded on a recording medium, and for advancing the recording medium at any one of a selected playback speed, fast forward speed and rewind speed,

an improved apparatus for reliably detecting interfeature pauses between features to control the selective replay of the recorded features, said apparatus including recording head sensor means operative for detecting

audio signals whose voltage amplitudes are above a predetermined voltage value to indicate the presence of features,

non-audio signals whose voltage amplitudes are below the predetermined voltage value to indicate the presence of inter-feature pauses, and

noise signals located within the inter-feature pauses and having voltage amplitudes above the predetermined voltage value at all advancement speeds of the recording medium, thereby resulting in apparatus malfunction in distinguishing between an inter-feature pause and a feature itself,

the improvement comprising:

(a) first signal-processing means for attenuating the noise signals to voltage amplitudes less than said predetermined voltage value in accordance with a first predetermined frequency response characteristic;

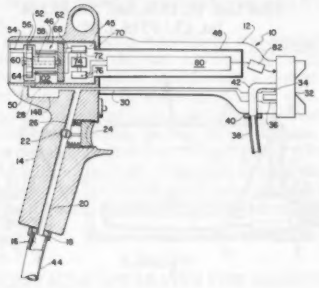
(b) second signal-processing means for attenuating the noise signals to voltage amplitudes less than said predetermined voltage value in accordance with a second predetermined frequency response characteristic; and

(c) control means for selecting said first signal-processing means when the recording medium advances at playback speed, and for alternately selecting said second signal-processing means when the recording medium advances at fast forward or rewind speed to thereby eliminate the aforementioned apparatus malfunction.

4,290,091
SPRAY GUN HAVING SELF-CONTAINED LOW VOLTAGE AND HIGH VOLTAGE POWER SUPPLIES

David H. Malcolm, Randolph, N.J., assignor to Speeflo Manufacturing Corporation, Houston, Tex.

Continuation of Ser. No. 754,161, Dec. 27, 1976, abandoned.
This application Jun. 11, 1979, Ser. No. 47,372
The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.
Int. Cl.[3] B05B 5/02
U.S. Cl. 361—228 30 Claims



1. Electrostatic spray coating apparatus devoid of external electrical power connection thereto comprising

means for emitting a spray of atomized coating material,

electrode means disposed adjacent the locus of atomization of said coating material for applying an electric charge to said atomized coating material, and

a self-contained electrical potential originating power supply for providing the operating voltage for said electrode means, said self-contained electrical potential originating power supply including,

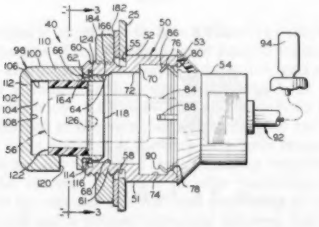
means for converting the kinetic energy of a moving air stream derived from a remote source thereof into an alternating voltage, and

long chain voltage multiplying means for converting said alternating voltage into a high direct current voltage for application to said electrode means.

4,290,092
LAMP ASSEMBLY LIGHT SHIELD AND RETAINING MEANS

David W. Bull, Hersey, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Aug. 27, 1979, Ser. No. 69,704
Int. Cl.[3] B60Q 3/04
U.S. Cl. 362—61 12 Claims

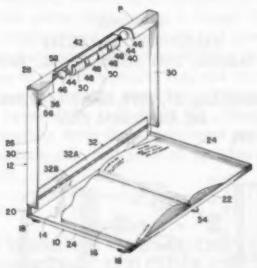


1. In a lamp assembly, the combination comprising body means adapted to be supported by associated support means and effective for operative connection to associated bulb socket means, and light shield means for detachable connection to said body means, a first open end formed in said body means, a second open formed in said body means, clearance passage means formed through said body means and operatively interconnecting said first and second open ends, said light shield means being detachably connected to said body means as to be supported and carried thereby and effectively closing said first open end, detent-like latching means effective for detachably securing said light shield means to said body means, said second open end being adapted to have operatively connected thereto said associated bulb socket means whereby bulb means carried by said socket means extends into said clearance passage means and upon energization emits light to the interior of said light shield means, said light shield means comprising a shield main body portion, said shield main body portion comprising a generally relatively forwardly disposed first closed end and a generally relatively rearwardly disposed second end, a recesslike cavity formed in said shield main body portion, said cavity having an end opening in said rearwardly disposed second end, said end opening being effective for receiving at least a portion of said associated bulb means therein, aperture means formed in said shield main body portion as to be located generally between said first closed end and said rearwardly disposed second end, said aperture means being effective for permitting the passage therethrough of light rays generated by said associated bulb means, said latching means comprising a generally annular groove carried by said body means, a resiliently deflectable retainer member generally contained by said groove, said retainer member comprising a plurality of integrally interconnected resiliently deflectable latching portions, said retainer member when normally contained by said groove having said plurality of latching portions extending through portions of said clearance passage means, and ramp-like surface means carried by said shield main body portion, said plurality of latching portions being effective to operatively engage said ramp-like surface means and resiliently restrain the detachment of said light shield main body portion from said body means.

4,290,093
PORTABLE ILLUMINATED MAGAZINE CASE

Tom Thompson, Campbell, and Kenneth A. Hirschberg, Saratoga, both of Calif., assignors to LITE-A-GUIDE, Inc., Los Gatos, Calif.

Filed Mar. 20, 1980, Ser. No. 132,254
Int. Cl.[3] F21J 33/00
U.S. Cl. 362—98 16 Claims



1. In a portable magazine case, or the like, with illuminating means for holding an opened magazine, or the like, for enclosing the same and to provide illumination for the pages to which the magazine is opened to facilitate reading the same, the combination comprising

a base which includes a bottom member of a size for support of a magazine, or the like, in an opened position,

a cover pivotally attached to said base and movable between open and closed positions relative thereto, said cover including a portion which projects beyond at least one edge of the base in the cover closed position, and

illuminating means attached to the cover at said projecting portion of said cover for illumination of said base, or

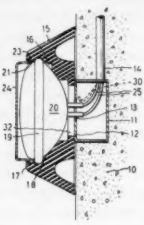
magazine positioned thereon, in the open position of the cover.

4,290,094

UNDERWATER OR WEATHERPROOF LIGHT

Henning Jensen, 13 Peter Parade, Mermaid Beach, Queensland, Australia (4218)

Filed Apr. 14, 1980, Ser. No. 139,811
Int. Cl.³ F21V *31/02*
U.S. Cl. 362—145 **9 Claims**



1. A light adapted for immersion in water and connectable to an electrical supply means by a conduit, said light including:

a non-sealing lamp mounting means;

a sealed beam electric lamp having at least a pair of filament contact posts on the rear thereof;

means retaining the lamp in the mounting means whereby the exterior of the lamp may be exposed to direct contract with water;

a waterproof insulated conductor wire electrically connected to each of the filament contact posts and extending through the conduit;

a small mass of waterproof material completely enclosing and seaing each filament contact post and respective electrical connection between the filament contact post and its respective conductor wire; and

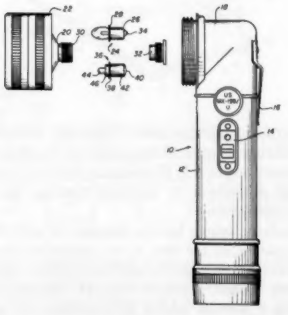
a heat-shrinkable sleeve shrunk over said small mass of waterproof material which encloses and seals the connections between said filament contact posts and conductor wires.

4,290,095

AIMING POST LIGHT

Robert C. H. Schmidt, 2631 Stafford Blvd., Bettendorf, Iowa 52722

Filed Aug. 27, 1979, Ser. No. 69,954
Int. Cl.³ . 04M *1/22*
U.S. Cl. 362—191 **5 Claims**



1. An aiming post light comprising a post, a flashlight having a bulb and batteries therein, and a bracket,

said flashlight having a belt clip thereon,

said flashlight projecting a beam of light at an angle of 90° to the axis of said batteries therein,

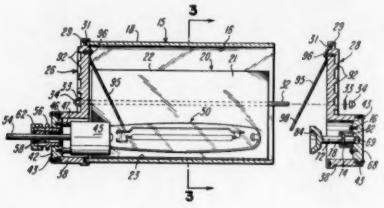
said bracket removeably connecting said flashlight belt clip with said post and positioning said flashlight thereon for emission of light in a substantially horizontal beam therefrom.

4,290,096

LIGHT FIXTURE

Roman Szpur, 2685 Culver Ave., Dayton, Ohio 45429

Filed Oct. 15, 1979, Ser. No. 84,554
Int. Cl.³ F71S *3/00*
U.S. Cl. 362—223 **11 Claims**



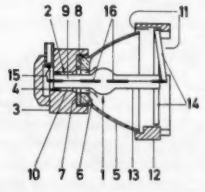
1. A light fixture adapted for use in an explosive environment containing flammable gases or particles, comprising an elongated light transmitting tube having opposite end portions, a set of end closure members mounted on said end portions of said tube, reflector means disposed within said tube and having a light reflecting surface, means located on one of said end closure members and supporting a lamp element within said tube, at least one of said end closure members including means defining a gap providing for the release of pressurized gas within said tube, and said gap defining means forming a path which abruptly changes the direction of the gas flowing through said gap for extinguishing any flame within the gas.

4,290,097

HIGH-PRESSURE DISCHARGE LAMP AND REFLECTOR COMBINATION

Werner Block, Taufkirchen; Manfred Pilsak; Klaus Düsedau, both of Munich, and Wolfgang Greiler, Unterhaching, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,664
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1978, 2840031
Int. Cl.³ F21V *7/20*
U.S. Cl. 362—264 **15 Claims**



1. High-pressure discharge lamp and reflector combination assembly comprising

an essentially bowl-shaped reflector (5) having a central opening at the reflector base end and open at the reflector light exit end;

a high-pressure discharge lamp bulb (1, 9, 13) having a pro-

jecting bulb base end (9) positioned longitudinally with respect to the reflector axis;

and a base (3) including an insulating, essentially cylindrical socket of temperature-resistant material formed with an inner recess slightly bigger than the bulb base end (9) to receive the bulb base end therein with clearance and to form an air circulation space between the base bulb end and said recess;

air circulation openings (3*a*) formed in the base and communicating with said air circulation space surrounding the bulb base end (9), distributed along the circumference of the base;

the bulb base end (9) being irremovably secured within said recess;

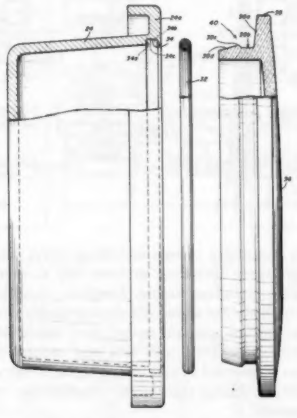
and the reflector (5) being individually and separately irremovably secured to the base, surrounding the projecting bulb base end and spaced therefrom, the central opening thereof being in air flow communication with said air circulating space to provide a continuous ventilating path from said air circulating opening (3*a*) in the base, through said air circulating space past the base end of the bulb and into the reflector, and out of the open lightemitting end of the reflector for heat exchange of ambient air between the inside of the base, the lamp bulb, and the reflector.

4,290,098

RECEPTACLE APPARATUS FOR HOUSING COMPONENTS OF A LIGHTING SYSTEM

Karl B. Pierson, Warren, Pa., assignor to Betts Machine Company, Warren, Pa.

Filed Aug. 10, 1979, Ser. No. 65,428
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—267 **12 Claims**



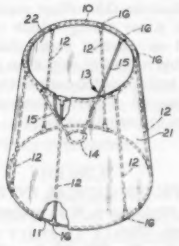
1. Receptacle apparatus for use in housing components of lighting systems of the class utilized to equip commercial vehicles such as trucks, trailers, buses and the like, said receptacle apparatus including an enclosure body, means for mounting the enclosure body on a vehicle, said enclosure body having an opening formed at one side thereof and defined by a circular end wall, inner portions of the enclosure body being removed to form an annular channel, a resilient sealing ring contained in the annular channel, a closure member occurring in spaced relation to the circular end wall and presenting an inner side, an outer side and a bottom extending between the inner and outer sides sealably secured to the enclosure body, said closure member having a cylindrical flange section and a tubular extension formed integrally therewith, said tubular extension being engageable with the sealing ring to detachably secure the cylindrical flange section in abutting relation to the circular wall, said tubular extension being further characterized by an extended annular sealing surface, the circumferential dimension of the extended annular sealing surface gradually increasing to form a retaining shoulder whose circumference is at a maximum at points substantially in a plane passing through the said inner side of the annular channel at right angles to the central longitudinal axis of the enclosure body, and the retaining shoulder being arranged to compressibly force the sealing ring against the bottom and outer side of the annular channel in displaced relationship along the said extended annular sealing surface.

4,290,099

LAMPSHADE

Nigel Vicars-Harris, Gwynedd, England, assignor to B. Blumenthal & Co., Inc., Carlstadt, N.J.

Filed Jun. 18, 1979, Ser. No. 49,647
Claims priority, application United Kingdom, Nov. 28, 1978, 46366/78
Int. Cl.³ F21V *1/06*
U.S. Cl. 362—352 **2 Claims**



1. A lampshade having a framework including an upper ring, a lower ring, a plurality of connecting rods connecting said rings and holding them in spacedapart relationship, a gimbal composed of a lampholder-annulus and struts extending therefrom to one of said rings, and a covering supported by the upper and lower rings of the framework, wherein the invention comprises tee-pieces on the ends of the rods for connecting the rods to the rings, each said tee-piece having a tubular socket part into which the respective end of the respective rod is friction fit, a resilient, stabilizing cross-piece on an end of the socket part, said cross-piece having a length that is at least equal to the length of said socket part, said cross-piece being slotted from end to end in order to establish a narrow gap that provides a snap fit on the respective ring and to conform to the arcuate ring curvature, and a respective stiffening web in each of the angles between the socket and the cross-piece, each of said webs extending from the approximate socket part midpoint to the approximate mid-point of the adjacent portion of the cross-piece.

4,290,100

FOUR TERMINAL VOLTAGE TRIPLER FOR MONOLITHIC LCD CLOCK CIRCUIT

David R. Squires, Cupertino, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Mar. 24, 1980, Ser. No. 132,819
Int. Cl.³ H02M *3/155*
U.S. Cl. 363—60 **12 Claims**

1. A circuit for tripling the voltage of a D.C. voltage supply comprising:

a first capacitor;

a second capacitor having a first terminal connected to a first voltage supply;

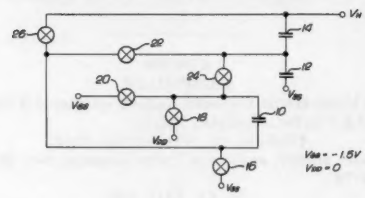
a third capacitor connected in series with the second capacitor, the third capacitor including a first terminal connected to the second capacitor and an output terminal; and

a plurality of switches for sequentially connecting the volt-

age supply and the capacitors in the following configurations:

(a) a first phase during which the first capacitor is connected across the voltage supply to thereby charge the first capacitor,

(b) a second phase during which the first capacitor is connected in parallel with the second capacitor,



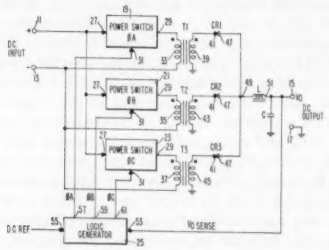
(c) a third phase during which the first capacitor is again connected across the voltage supply, and

(d) a fourth phase during which the first capacitor is connected in parallel with the second capacitor, whereby by repeating said four phases a plurality of times, the voltage at the output terminal referenced to a second terminal of the voltage supply will approach three times the supply voltage.

4,290,101
N PHASE DIGITAL INVERTER

Odo Hergenhan, Hightstown, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 865,403, Dec. 29, 1977, abandoned. This application Dec. 31, 1979, Ser. No. 109,128
Int. Cl.[3] H02M 3/22
U.S. Cl. 363—65 **10 Claims**



1. A single feedback loop N-phase digital inverter for converting a first DC level into a second DC level comprising:

a first and a second input terminal for receiving therebetween said first DC level;

a first and second output terminal for outputting therebetween said second DC level;

a plurality of switching means for passing and inhibiting current flow, each switching means therein having an input lead connected to said first input terminal, an output lead, and a control terminal for receiving pulses to control the passing and inhibiting of current flow between said input lead and said output lead;

a plurality of transformers, each transformer therein having a primary winding with one end thereof connected to said output lead of an individually associated switching means in said plurality thereof and the other end connected to said second input terminal, each transformer also having a secondary winding with a first and a second end thereof, said second end being connected to said second output terminal;

a plurality of rectifiers, each rectifier having a first rectifier end connected to said first end of said secondary winding of an individually associated transformer in said plurality thereof, and a second rectifier end joined together with all other said second rectifier ends;

filtering means connected between said joined second ends of said rectifiers and said first output terminal for providing voltage filtering therebetween;

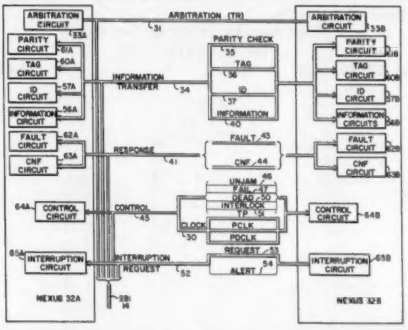
a single feedback path having a first and a second end, said first end thereof connected to said first output terminal; and

logic generator means connected to said second end of said single feedback path, said logic generator means providing pulses sequentially to said control terminal of each switching means in said plurality thereof for maintaining said second DC level at a constant value.

4,290,102
DATA PROCESSING SYSTEM WITH READ OPERATION SPLITTING

John V. Levy, Palo Alto, Calif.; David Rodgers, Acton, Mass.; Robert E. Stewart, Stow, Mass., and Richard J. Casabona, Stow, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 845,411, Oct. 25, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,566
Int. Cl.[3] G06F 13/00
U.S. Cl. 364—200 **12 Claims**



1. A data processing system including a first data means, a second data means including at least one storage location, transfer means including timing, function, identification, address and confirmation signal conveying means connected to said first data means and said second data means for transferring information between said first and second means and timing means connected to said timing signal conveying means for transmitting timing signals for establishing consecutive transfer intervals:

A. said first data means including means for transmitting onto said transfer means during a first transfer interval one of a plurality of commands, each command having a function signal portion for defining a transfer function to be performed, an identification signal portion for identifying said first data means and an address signal portion for identifying a location in said second data means to or from which the transfer of data is to occur, said first data means transmitting the function, identification and address signal portions onto said function, identification and address signal conveying means in said transfer means, and further including means for receiving confirmation signals from said confirmation signal conveying means in the transfer means during a subsequent transfer interval a predetermined number of transfer intervals after the first transfer interval,

B. said second data means including:

i. control means connected to said timing signal conveying

means for controlling a transfer in response to signals from said timing means,

ii. command responsive transfer means connected to said control means, said function signal conveying means and said address signal conveying means, responsive to the receipt of a command for transferring data between the location identified by the address portion received from said address signal conveying means and said transfer means,

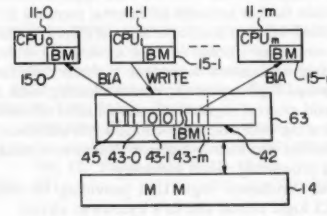
iii. identification means connected to said control means and said identification signal conveying means for storing the identification portion from said identification signal conveying means that identifies said first data means, and iv. confirmation means connected to said confirmation signal conveying means, said timing signal conveying means and said command responsive transfer means responsive to the receipt of a command from said first data means for transferring a confirmation signal on said confirmation signal conveying means said predetermined number of transfer intervals after said command responsive transfer means has received the command.

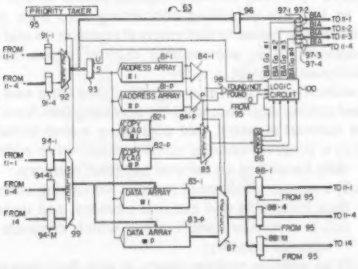
4,290,103

SYSTEM AND METHOD FOR ACHIEVING BUFFER MEMORY COINCIDENCE IN A MULTIPROCESSOR SYSTEM

Akira Hattori, Yokohama, Japan, assignor to Fujitsu Limited, Japan

Filed Oct. 30, 1978, Ser. No. 955,760
Claims priority, application Japan, Dec. 29, 1977, 52-160451
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **26 Claims**





1. A method for achieving buffer memory coincidence in a multiprocessor system comprising the steps of:

providing a plurality of central processing units, a plurality of buffer memories, one for each central processing unit, each buffer memory being contained in a respective one of said central processing units, a main memory commonly utilized by said central processing units, and an intermediate buffer memory operatively connected between said main memory and said buffer memories, said intermediate buffer memory having a plurality of data block memory areas for storing respective corresponding data blocks, and a plurality of supervising information memory areas, one for each data block memory area, each supervising information memory area being coupled to a respective corresponding one of said data block memory areas, each supervising information memory area storing supervising information indicating whether or not a copy of one of said respective corresponding data blocks stored in said respective corresponding one of said data block memory areas is stored in each of said buffer memories;

detecting when one of said central processing units provides a request for accessing a data block in said intermediate buffer memory;

detecting whether or not said request is a request sent to said intermediate buffer memory for writing a data block;

if said request is a request for writing a data block, detecting whether or not the accessed data block is found in said intermediate buffer memory;

if said accessed data block is not found in said intermediate buffer memory, sending buffer invalidation address information to all of said buffer memories other than the buffer memory contained in the accessing central processing unit, said buffer invalidation address information having an address identical to the address of said accessed data block;

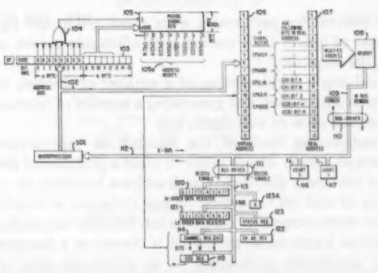
if said accessed data block is found in said intermediate buffer memory, sending said buffer invalidation address information only to selected ones of said buffer memories, said selected ones of said buffer memories being determined by said intermediate buffer memory in accordance with said supervising information.

4,290,104

COMPUTER SYSTEM HAVING A PAGING APPARATUS FOR MAPPING VIRTUAL ADDRESSES TO REAL ADDRESSES FOR A MEMORY OF A MULTILINE COMMUNICATIONS CONTROLLER

Thomas O. Holtey, Newton; Robert C. Miller, Braintree, and Kin C. Yu, Burlington, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1979, Ser. No. 463
Int. Cl.³ G06F *9/06, 9/36*
U.S. Cl. 364—200 **11 Claims**



1. A computer system having a paging apparatus for mapping virtual addresses to real addresses of a real memory, comprising:

(a) a first means for generating a first predetermined number of virtual addresses;

(b) signal means, coupled to said first means, for generating a set of control signals in response to said virtual addresses, said set of control signals having either a first or a second state, said second state having a plurality of selectable substates;

(c) storage means containing address modification data; and

(d) gating means, coupled to said first means and said storage means, for forming real addresses, said gating means responding to said set of control signals in said first state to form a real address equal to a first virtual address and responding to said set of control signals in a selected

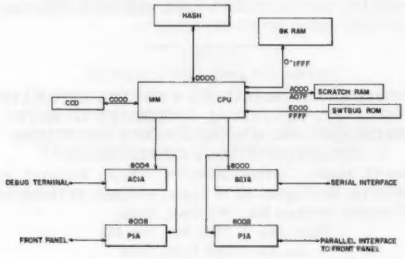
substate of said second state to form a real address from bits of said address modification data and from bits of a second virtual address, the number of bits of said address modification data and the number of bits of said second virtual address used to form said real address being determined by the selected substate of said set of control signals.

4,290,105

METHOD AND APPARATUS FOR TESTING MEMBERSHIP IN A SET THROUGH HASH CODING WITH ALLOWABLE ERRORS

Richard J. Cichelli, Allentown; Michael Q. Thompson, Bethlehem, and William R. Cheswick, New Hope, all of Pa., assignors to American Newspaper Publishers Association, Easton, Pa.

Filed Apr. 2, 1979, Ser. No. 26,114
Int. Cl.³ G06F *7/00*
U.S. Cl. 364—200 **15 Claims**



1. A process for performing a set membership test by the technique of binary hash coding with allowable errors, comprising the steps of:

a. receiving a source listing of a number of discrete items which define a set, and generating a number of representations for each of said items; and

b. randomizing each of the number of representations through a hash step in order to yield a plurality of simple and randomly distributed hash address locations for each item of said set regardless of any variation in length for each item comprising the given set, wherein the number of address locations so generated is chosen as a function of the acceptable probability of an erroneous true when testing an item for membership; and

c. storing a binary indicator (a single binary value, i.e., 0 to 1) at each of the plurality of hash address locations generated for each item of the set within a bulk storage memory device, without the ability to reconstruct the items of the set given the storage locations; and

d. receiving a new item and examining said new item for set membership by repeating said generating and hashing steps upon said new item to thereby generate an equal number of new item hash address locations, and performing an AND operation upon all of the indicator values at said new item hash address locations to determine if there is a match with the set of previously stored indicators; and

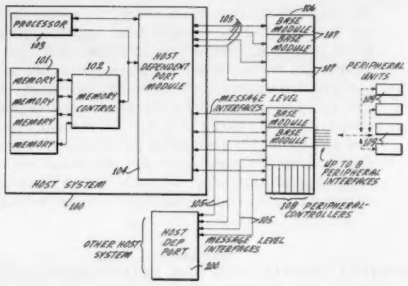
e. outputing whether there is or is not a match between all the indicators at the new item locations and the previously stored indicators defining the set.

4,290,106

MICROPROCESSOR SYSTEM WITH SOURCE ADDRESS SELECTION

Robert D. Catiller, Garden Grove, and Brian K. Forbes, Huntington Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 27, 1979, Ser. No. 52,477
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **12 Claims**



1. A universal-type microprocessor system which cooperates with an application-dependent logic module to form a peripheral-controller capable of handling data transfers between main memory of a host computer and a plurality of peripheral terminal units which can be either "word-oriented" or "byte-oriented", and wherein said application-dependent logic module provides external register means having bus connections to said plurality of peripheral terminal units and to said host computer, and wherein said application-dependent logic module further includes an external memory for storage of programs related to control of said peripheral terminal units and for temporary storage of data undergoing transfer, and wherein said application-dependent logic module further includes control logic means for communicating with and controlling: said external register means, said external memory and communicating with a decoder-controller in said microprocessor system, the said microprocessor system comprising:

(a) data processing means including:

(a1) an Arithmetic logic Unit providing an output to a shift logic circuit and to a byte-swap circuit;

(a2) a shift logic circuit providing output to an I/O bus;

(a3) a byte-swap circuit providing output to said I/O bus;

(b) an I/O bus providing connecting lines from said data processing means to said external registers, to said external memory, to an accumulator register means, and to an addressing means;

(c) addressing means receiving input data from said I/O bus and storing addresses used for accessing data from internal or external memory, said addressing means including:

(c1) a program counter storing consecutive addresses of data located in an internal program memory;

(c2) a memory reference register for storing addresses of data located in said external memory, and including:

(c2-1) a memory address bus which connects to said external memory;

(c3) an address register means in said decoder-controller and providing an address bus to a plurality of accumulator registers for selection of data from/to an addressed accumulator register;

(d) internal program memory for storing program instructions and data words, said internal memory being addressed from said program counter and providing instruction words and data, via an instruction bus, to a register means.

(e) register means for temporary storage of data, said register means including:

(e1) a plurality of addressable accumulator registers which provide an output to the input of said Arithmetic Logic

Unit, said accumulator registers receiving input data words from said I/O bus, said plurality of accumulator registers, including:

(e1-1) address bus means from said decoder-controller for addressing selected registers in said plurality of accumulator registers;

(e2) a memory operand register for receiving operand data from said internal program memory via an instruction bus or from said external memory via a memory data bus; said operand register providing an output to the input of said Arithmetic Logic Unit;

(e3) an instruction register for receiving instruction words and data from said internal program memory via said instruction bus or receiving data from said external memory via a memory data bus and providing instruction words and data to said decoder-controller;

(f) an instruction decoder-controller receiving instruction signals from said instruction register, and including incoming and outgoing control signal lines connected to said data processing means, to said addressing means, to said register means, to said internal and external memory means, to said external registers and said control logic means;

(g) an external memory data bus for carrying data from said external memory to said instruction register and said memory operand register.

(h) program instruction words in said internal program memory wherein each instruction word includes a bit field "M" which is used to signal said decoder-controller to select either said program counter or said memory reference register as the next address source for data to be transmitted to said instruction register or said memory operand register.

4,290,107

ELECTRONIC FUEL CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

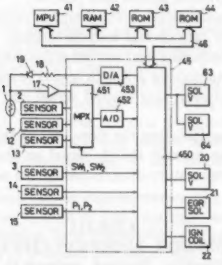
Seiji Suda, Mito; Taiji Hasegawa, Minato; Yasunori Mouri, Katsuta, and Toshio Furuhashi, Tomobe, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 25, 1979, Ser. No. 42,495

Claims priority, application Japan, Jun. 2, 1978, 53-66568

Int. Cl.³ F02B *3/00*; F02D *35/00*

U.S. Cl. 364—431 **11 Claims**



9. A processor-based control apparatus for controlling the supply of fuel to an internal combustion engine comprising:

regulation means for controlling the air-fuel ratio of a mixture of fuel and air to be supplied to said engine in response to a control signal applied thereto;

first sensor means for producing a first detection signal representative of the oxygen concentration in exhaust gas emitted by said engine;

second sensor means for generating pulses in accordance with the rotation of the engine crankshaft;

third sensor means for producing a second detection signal representative of the negative suction pressure of a suction pipe of an engine cylinder; and

a control unit, responsive to the pulses generated by said second sensor means and to the first and second detection signals produced by said first and third sensor means, for generating said control signal to be supplied to said regulation means, whereby the air-fuel ratio is controlled,

said control unit comprising

memory means for storing data representative of fluctuations in the air-fuel ratio versus quantity of suction air, and data representative of signals produced by said sensor means, and

a processor unit coupled to said memory means, said processor performs the following functions:

(a) generating, in response to pulses generated by said second sensor means and said second detection signal, first prescribed data representative of the quantity of suction air for said engine,

(b) generating data representative of the duty cycle of said control signal associated with the air-fuel ratio determined in accordance with said first prescribed data,

(c) evaluating the maximum value and the minimum value of said first detection signal capable of being produced by said first sensor means,

(d) generating a signal representative of a threshold level V_s intermediate said maximum and minimum values, in response to step (c), and

(e) comparing said threshold level V_s representative signal with said detected signal and generating data representative of a correction of said duty cycle-representative data generated in step (b) in accordance with a predetermined relationship between said threshold level V_s representative signal and said detected signal.

4,290,108

CONTROL UNIT FOR A CONVERTER

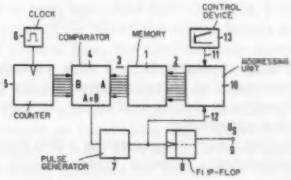
Patrick Woehrle, Erlangen; Adolf Habock, Uttenreuth, and Paul F. Müller, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 51,371

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829793

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—480 **10 Claims**



1. A circuit for forming a periodic control signal having a predetermined pulse pattern for modulating a converter stage comprising:

a memory for storing code words designating the position of switching pulse edges of a periodic control signal for a time interval, divided into increments, of up to one period of one of the AC input voltage and the output voltage of the converter, the memory having an address input, a memory advancing input, and a code word output comprising pulse patterns of a control signal for modulating a converter stage;

a clock generator for generating clock pulses, each clock pulse representing one increment;

a first counter coupled to the clock generator for counting the clock pulses and forming a count word;

a digital comparator having a first input coupled to the code word output of the memory and a second input coupled to the counter word output of the counter, and the compara-

tor generating an output signal upon each agreement of the code word and the count word;

a pulse generator coupled to the signal at the output of the comparator and having an output coupled to the memory advancing input; and

a second counter coupled to the output of the pulse generator and having an output signal coupled to the address input of the memory, the second counter generating a first subaddress upon each agreement of the code word and the count word; and

a shift register having an output coupled to the memory address input, the shift register responsive to a modulation control signal for cyclically generating a second subaddress and supplying it to the memory.

4,290,109

ELECTRIC MONITORING METHOD AND APPARATUS FOR ELECTRIC SYSTEM OF AUTOMOTIVE VEHICLE

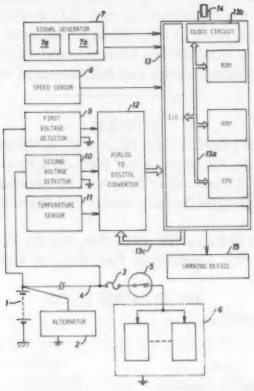
Koichi Taniguchi, Chita; Minoru Katayama, Toyohashi; Osamu Sangu, Toyota, and Shinichi Hori, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 2, 1979, Ser. No. 26,167

Claims priority, application Japan, Apr. 10, 1978, 53-42466

Int. Cl.[3] G08B *21/00*

U.S. Cl. 364—481 **14 Claims**



9. Monitoring apparatus for use with a secondary energy source connected to an alternator driven by the prime engine of a vehicle and to an electric load circuit through a conductor, said apparatus comprising:

first detecting means for generating a first signal related to the instantaneous terminal voltage across said energy source;

second detecting means for generating a second signal related to the instantaneous terminal voltage across said load circuit;

signal generating means for selectively generating first and second travel mode signals, respectively indicative of first and second travel modes of the vehicle;

means responsive to said first and second electric signals and said first and second travel mode signals for selectively generating one of a first reference value and a second reference value, said first and second reference values being generated from first and second relationships, respectively, with the load current corresponding with the terminal voltage across said load circuit, said first and second reference values being generated when said first and second travel mode signals, respectively, are being generated, said reference values representing a minimum performance for normal functioning of the circuit comprising said energy source, alternator, conductor, and load circuit, said calculating means also including means for comparing a value related to said first signal with said reference values; and

warning means for producing a warning signal when the said first signal is lower than said first reference value during said first travel mode and said second reference value during said second travel mode.

4,290,110

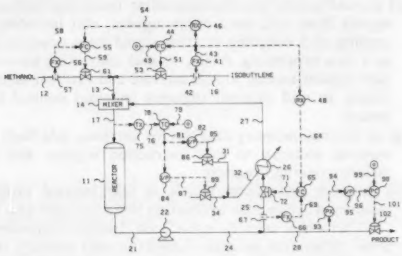
TEMPERATURE CONTROL FOR A REACTOR

Donald J. Makovec, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Nov. 8, 1979, Ser. No. 92,779

Int. Cl.[3] G06G *7/58;* G05D *11/13*

U.S. Cl. 364—500 **9 Claims**



1. Apparatus comprising:

a reactor;

means for supplying a first feed stream containing a first reactant to the feed inlet of said reactor;

means for withdrawing the reaction product from said reactor;

means for passing a portion of said reaction product as a recycle stream to the feed inlet of said reactor;

means for establishing a first signal representative of the flow rate of said first feed stream;

means, responsive to said first signal, for establishing a second signal representative of the flow rate of the recycle stream required to substantially maintain a desired temperature differential across said reactor;

means for establishing a third signal representative of the actual flow rate of said recycle stream;

means for comparing said second signal and said third signal and for establishing a fourth signal responsive to the difference between said second signal and said third signal; and

means for manipulating the flow rate of said recycle stream in response to said fourth signal to thereby maintain a desired temperature differential across said reactor.

4,290,111

DECIBEL ADDITION CIRCUIT

Keith Dillon, Worthing, England, assignor to The Singer Company, Binghamton, N.Y.

Filed Dec. 12, 1979, Ser. No. 102,708

Claims priority, application United Kingdom, Mar. 14, 1979, 8925/79

Int. Cl.[3] G06F *7/556;* G06G *7/24*

U.S. Cl. 364—768 **10 Claims**

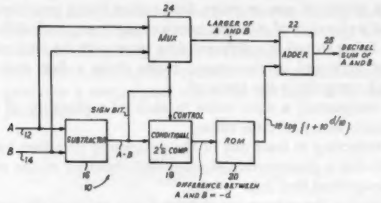
1. A decibel addition circuit for adding two signals in the decibel form of measurement directly, comprising:

means for determining which of said two signals is the larger,

means for determining the difference in magnitude between said two signals,

means responsive to said difference in magnitude for generating a signal having a value of 10 log $[1+10^{d/10}]$, and

means for adding said signal generated by said last-mentioned means to the larger of said two signals determined



by said first-mentioned means for providing the decibel sum of said two decibel signals.

4,290,112
METHOD AND APPARATUS FOR ELECTRO-OPTICALLY CONVOLUTING A ONE-DIMENSIONAL SIGNAL

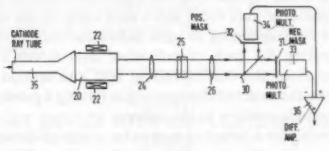
Jacob S. Baumann, Pynacker, and Ronald J. Geluk, Nootdorp, both of Netherlands, assignors to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed May 4, 1979, Ser. No. 36,097

Claims priority, application Netherlands, May 5, 1978, 7804881

Int. Cl.³ G06G *7/19, 9/00*

U.S. Cl. 364—822 **26 Claims**



19. An apparatus for convoluting a signal representing a profile formed during X-ray tomography and a filter function, which comprises:

an image intensifier tube having a deflection coil, said image intensifier tube includes an anode for producing a longitudinally moving linear image of said signal in which brightness varies along said linear image.

two mirrors having surfaces and mounted at a predetermined angle relative to one another for expanding said linear image transverse to said longitudinally moving linear image and for splitting a light beam into two light beams, said surfaces being in the shape of cylindrical segments;

at least two mask means representative of a portion of said filter function in each of said two light beams;

means for detecting light transmitted through each of said mask means to produce an output signal; and

differential amplifier means for receiving said output signal from said detector means and for producing an electric signal representative of convolution.

23. A method for electro-optically convoluting a signal representing a profile formed during X-ray tomography and a filter function which comprises:

(a) electro-optically reproducing said signal as a line-shaped image having one dimension and having its brightness varying there along respectively;

(b) converting said line-shaped image into a two-dimensional light beam having a first dimension corresponding to said one dimension and a second dimension corresponding to an expansion of said line-shaped image in a direction transverse to one dimension;

(c) projecting said two dimensional light beam through a beam splitter onto a first mask representative of a positive portion of said filter function and onto a second mask representative of a negative portion of said filter function;

(d) detecting light transmitted through each mask to produce output signals herefrom; and

(e) generating a difference between said output signals to produce an electric signal representative of said profile.

4,290,113
MINICOMPUTER

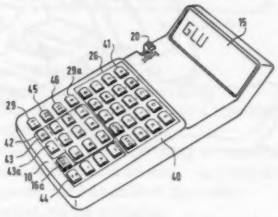
Rolf Haker, Frankenthal; Heinz-Georg Führer, Rauenberg; Rainer van Rijckevorsel, Mannheim; Werner Ruhl, Ludwigshafen, and Joachim Thiery, Mannheim, all of Fed. Rep. of Germany, assignors to Labora Mannheim GmbH für Labortechnik, Mannheim, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 964,930

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755407

Int. Cl.³ G06F *3/02*

U.S. Cl. 364—900 **7 Claims**



1. Minicomputer for converting values, especially of a medicinal nature, between two systems of units, the minicomputer having manually actuatable numeral, letter, function and clearing keys, a computer unit having computing circuits responsive to numeral, function and clearing keys, respectively, a readout or display unit, respectively responsive to actuation of the keys and the computing circuits, and a fixed program memory wherein calculating routines and conversion factors for the calculation and conversion, respectively, between the two systems of units are stored whereby, upon actuation of a function key, one of the stored conversion factors is addressed thereby and entered from the fixed-program memory into a register of the computer unit, the improvement comprising means in the fixed-program memory for storing not only the conversion factors but also dimensions pertaining thereto in the form of letters, an interlinking logic operative upon actuation of a plurality of letter keys for selectively addressing the respective memory locations for the medical conversion factors and the dimensions pertaining thereto, and a call-up unit operative upon actuation of one of the function keys for display of the dimensions to cause the memory to issue the addressed dimension to the display unit.

4,290,114
MEDICAL DIAGNOSTIC COMPUTER

Hanon S. Sinay, 1601 Chestnut Ave., Manhattan Beach, Calif. 90266

Filed Jul. 1, 1976, Ser. No. 702,337

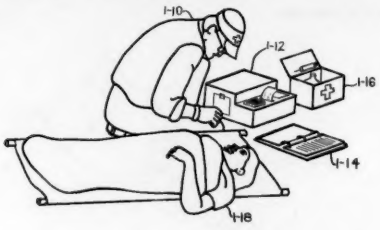
Int. Cl.³ G06F *15/42*

U.S. Cl. 364—900 **5 Claims**

1. The method of operating a programmed automatic electronic computer to designate appropriate medical treatment for a patient who has been examined to determine each medical finding out of a predetermined set of medical findings which is present in the patient, the computer being adapted to have loaded therein and to read a readily interchangeable mass

memory unit, said computer also including an entry unit and an output display system, said method comprising the steps of:

(a) loading the computer with a preprepared, readily interchangeable mass memory unit having stored therein signals representing the definitions of a plurality of disease entities, each disease entity definition including signals representing a plurality of corresponding selected disease codes, each corresponding selected disease code representing one out of the predetermined set of possible medical findings with respect to any patient's condition, and also including signals representing a plurality of logic codes which, together with the selected disease codes, designate a corresponding logical combination of the selected individual disease codes which defines the disease entity, said mass memory unit also having stored therein, for each disease entity definition, corresponding signals representing at least one corresponding treatment code representing an appropriate medical treatment to be given to any patient whose medical condition satisfies the disease entity definition;



(b) for each one of the predetermined set of medical findings found in the patient being treated, operating the entry unit of the computer to enter and to store in the computer electrical signals representing the corresponding disease code, whereby the stored patient disease codes represent the medical condition of the patient being treated;

(c) operating the computer to read the contents of the mass memory unit and to respond to the logic code signals and selected disease code signals of each disease entity definition to perform a corresponding logical testing of the stored patient disease codes to test and indicate if they satisfy the corresponding logical combination of selected disease codes of the disease entity and, for each of the disease entity definitions whose logical combination of selected disease codes is satisfied by the stored patient disease codes, display indicia representative of the corresponding treatment codes;

whereby the displayed indicia are representative of the treatment codes for all of the satisfied disease entity definitions.

4,290,115

DATA PROCESSING METHOD AND MEANS FOR DETERMINING DEGREE OF MATCH BETWEEN TWO DATA ARRAYS

Paul E. Pitt, Cypress; Edward L. Glaser, Santa Monica, and Louis M. Galie, Culver City, all of Calif., assignors to System Development Corporation, Santa Monica, Calif.

Filed May 14, 1979, Ser. No. 38,518

Claims priority, application United Kingdom, May 31, 1978, 25738/78

Int. Cl.³ G06F *15/40*

U.S. Cl. 364—900 **57 Claims**

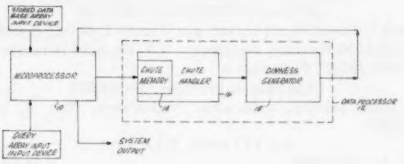
1. A method utilizing data processing means comprising a plurality of data stores and a corresponding temporary store for each such data store, the method determining a particular criterion value and an associated positional value for the degree of match between the juxtaposition of a plurality of event types of a query and a plurality of event types of a stored data base entry, the method utilizing a priorly-formed array of data values, each data value representing the number of event positions between the occurrence of an event type in the query, the occurrence of a corresponding event type in the stored data base, a group of one or more data values being provided for each of a plurality of different query event types, each different group being stored in a different data store with the data values thereof arranged in monotonic order from a first end, the method comprising the steps of:

(a) designating a data value in each of a plurality of data stores as a first data value;

(b) detecting at least one of the designated first data values having a predetermined magnitude relative to the other designated first data values;

(c) storing the at least one detected data value in the temporary store which corresponds to the data store in which such detected data value is detected;

(d) forming for each of individual data stores a first distance value which represents the algebraic difference between the detected data value and the designated data value in such data store;



(e) forming for each of individual data stores a second distance value representing the algebraic difference between the detected data value and a data value in the temporary store corresponding to such individual data store;

(f) selecting for each of individual data stores a distance value from the corresponding first and second distance values, the selected distance value having a predetermined magnitude relative to the other;

(g) forming for a detected data value a sum-of-distance value representing the sum of the absolute values of the selected distance values formed therefrom;

(h) designating a new data value in the data value store containing the at least one detected data value and repeating the steps (b)–(h) using such new data value as a designated data value,

the step of designating a new data value including the step of designating, in a predetermined order in the monotonic order of data values, the next data value from the one which was previously designated; and

(i) utilizing the detected data values and the corresponding sum-of-distance values provided during steps (b)-14 (h) for deriving such criterion value and positional value.

4,290,116

METHOD AND APPARATUS FOR OPERATING A PRINTER

Timothy C. Morse, Salem, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed May 21, 1979, Ser. No. 40,866

Int. Cl.³ G06F *3/12, 11/00*

U.S. Cl. 364—900 **23 Claims**

1. Control means for operating a printer having a printer carriage, paper feed means, carriage drive means and printing means, said control means comprising:

microprocessor means responsive to data and control codes for controlling printer operations;

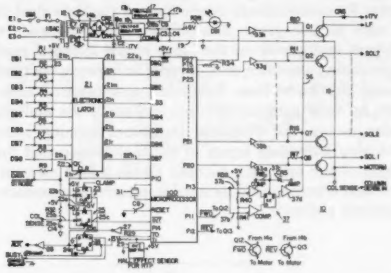
latch means for receiving incoming code words selectively representing data and commands loaded into said latch means by a strobe pulse following each code word;

means responsive to said strobe pulse for loading each of said code words into said microprocessor means;

said microprocessor means including memory means for storing character codes;

examining means for determining the type of code word present, said examining means further including means for generating a buffer full signal when loading the code words into memory means is completed;

sensor means sensing the location of the printer carriage to generate a start signal when the carriage is in the start position;



print initiating means in said microprocessor for initiating printing responsive to said buffer full signal and said start signal;

said printing initiating means including means for setting a predetermined time delay interval and means to reexamine said sensor means in the event that the buffer full signal condition and the start signal are not present at the first examination; and means responsive to the presence of said predetermined time interval for reactivating said examining means.

4,290,117

MEMORY DEVICE WITH CIRCULATING STORAGE LOOPS

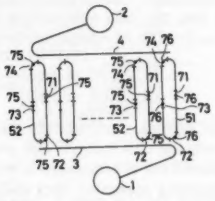
Mamoru Sugie, Hachioji; Noboru Yamaguchi, Kokubunji; Koichi Mayama, Mobara; Yuzo Kita, Fuchu; Shigeru Yoshizawa, Tokorozawa; Nobuo Saito, Mitaka, and Atsushi Asano, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,066

Claims priority, application Japan, Feb. 17, 1978, 53-16490

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—15 **8 Claims**



1. A memory device comprising:

storage means having a plurality of information storage loops, in each of which information representing whether or not the corresponding storage loop is a defective loop is written in a predetermined address of the corresponding storage loop; and

at least one marker storage loop in which a specific marker is written in a specified address corresponding to the predetermined address of said information storage loop; and

control means for reading and writing information of the same addresses of the respective storage loop of said storage means in parallel.

4,290,118

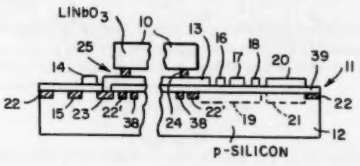
SOLID STATE DEVICES COMBINING THE USE OF SURFACE-ACOUSTIC-WAVE DEVICES AND CHARGE-COUPLED DEVICES

Ernest R. Stern, Concord; Richard W. Ralston, Bedford; Daniel L. Smythe, Jr., Carlisle, and Barry E. Burke, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 28, 1979, Ser. No. 80,100

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—183 **19 Claims**



1. A solid state device comprising

a surface acoustic wave device including

a first substrate capable of supporting a travelling acoustic wave signal on a surface thereof;

means for generating a first travelling acoustic wave input signal on said surface, said acoustic wave signal having an electromagnetic field associated therewith;

a charge-coupled device including

a second substrate having an insulating layer positioned on a surface thereof adjacent said first substrate so as to form a spatial region therebetween;

a plurality of charge storage wells, each capable of holding a charge therein;

interface means comprising

a plurality of conductive means positioned on said insulating layer each of said conductive means electrically connected at at least one end to said second substrate and associated with one of said charge storage wells of said charge-coupled device, each of said conductive means being responsive to a portion of the electromagnetic field of said acoustic wave signal to produce on said conductive mean' voltage potential proportional to the corresponding portion of the electromagnetic field;

a plurality of first storage means each capable of being formed in said second substrate and associated with each of said conductive means for storing a charge therein;

said plurality of charge storage wells capable of being formed in said charge-coupled device and associated with each of said conductive means;

means for transferring charges between said first storage means and their associated charge storage wells.

4,290,119

MEMORY DEVICE PROTECTED AGAINST UNDESIRABLE SUPPLY VOLTAGE LEVEL

Kouji Masuda, Ohme; Masao Mizukami, Yokohama, and Nobuaki Kitamura, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Ome Electronic Co., Ltd., both of Tokyo, Japan

Filed Feb. 7, 1980, Ser. No. 119,519

Claims priority, application Japan, Feb. 23, 1979, 54/19775

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—189 **9 Claims**

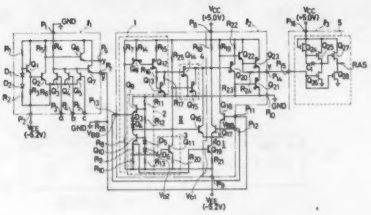
1. A memory device comprising:

memory circuit means including memory cells and means for accessing to desired memory cells; and

driver means connected to said memory circuit means for driving said access means; wherein:

said driver means comprises:

emitter coupled logic means connected to first and second supply voltage for providing switch-on and switch-off signals in response to first and second input signals, respectively, wherein said first supply voltage is larger than said second supply voltage, said switch-on and switch-off signals lie between said second supply voltage and third supply voltage which lies between said first and second voltages, and said first and second input signals lie between said second and third supply voltages;



switch means connected to said emitter coupled logic means for providing said access means with a drive signal of a low level in response to said switch-on signal and with a non-drive signal of a high level in response to said switch-off signal; and

control means connected to said first to third supply voltages for clamping the output of said emitter coupled logic means to said non-drive signal when an operating point defined by said first and second supply voltages does not belong to a predetermined region, and wherein:

said access means is means enabled in response to said drive signal.

4,290,120

CIRCUIT ARRANGEMENT FOR READING OUT AND REGENERATING ITEMS OF INFORMATION STORED IN ONE-TRANSISTOR STORAGE ELEMENTS

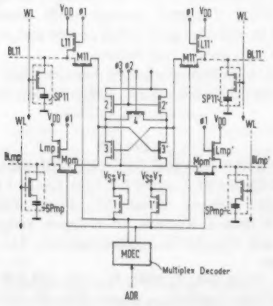
Karl U. Stein, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 23, 1979, Ser. No. 69,175

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842547

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—205 **2 Claims**



1. A circuit arrangement for reading out and regenerating items of information stored in one-transistor storage elements, comprising: a plurality of word lines and bit lines; storage element means addressed by the activation of a word line during read-out for transferring an existing information charge into assigned bit lines; said assigned bit lines being connected to influence inputs of assigned read-out/regenerating amplifiers; m bit lines in each case being combined as line groups (1, 2 . . . m; m+1, m+2, . . . 2m; (p−1) m+1, (p−1) m+2 . . . pm); each of said bit line groups being assigned to a multiplexer; individual bit lines of a bit line group being connected to individual inputs of the assigned multiplexer; the assigned multiplexers each being connected by one output to the input of an assigned read-out/regenerating amplifier; a multiplex decoder means for consecutively connecting all the individual bit lines of each bit line group in a predetermined sequence via the relevant multiplexer to the input of the assigned read-out/regenerating amplifier; and, in order to improve the transfer of charge into the bit lines, threshold transistors are connected in pairs by their gates to relevant outputs of the multiplex decoder means, the threshold transistors forming means for switching individual inputs of the multiplexer; and for each output of the multiplex decoder means a load element being provided whose second terminal is in each case connected to a threshold potential.

4,290,121

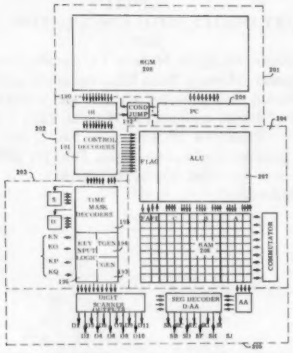
VARIABLE FUNCTION PROGRAMMED CALCULATOR

Gary W. Boone, and Michael J. Cochran, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 856,932, Dec. 2, 1977, which is a continuation of Ser. No. 420,999, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 163,565, Jul. 19, 1971, abandoned. This application Jan. 12, 1979, Ser. No. 2,816

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—233 **4 Claims**

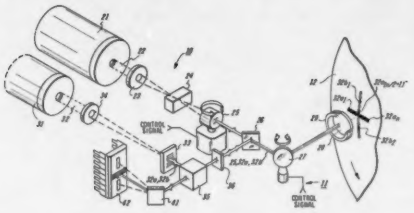


1. In data processing apparatus, data storage means in the form of an array of rows and columns of memory cells arranged in N columns with N cells in each row, where N is an integer greater than two, means for repeatedly generating N timed address signals in a given time period for addressing columns of the cells in sequence, means for generating output timing signals recurring once for each complete sequence of N address signals, means for providing coded representations of the address signals and of the output timing signals, means for detecting coincidence between the coded representation of the address signals and the coded representation of the output timing signals to produce coincidence signals, and means responsive to the coincidence signals for causing data to be read out of the data storage means into output means.

4,290,122
SELF-SYNCHRONIZING CLOCK SOURCE FOR OPTICAL MEMORIES

Roger D. Bates, Los Altos, and Gordon R. Knight, Cupertino, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 14, 1979, Ser. No. 39,222
Int. Cl.[3] G11C *13/04;* G11B *7/14*
U.S. Cl. 365—234 7 Claims



1. A digital optical memory for use with a recording medium having at least one band of tracks, each such band including at least one data track for storing data and a servo track containing periodic clock pulses; said memory comprising

optical means for simultaneaously focusing a first light beam on said data track and a second light beam on said servo track, whereby said first and second light beams are modulated in accordance with said data and said clock pulses, respectively;

servo control means coupled to said optical means for maintaining said second light beam on said servo track; and

detector means positioned to intercept said first and second modulated light beams, thereby simultaneously providing a first signal representing said data and a second signal representing a local source of clock frequency information.

4,290,123
TOWED ARRAY CONDITION APPRAISAL SYSTEM

George O. Pickens, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

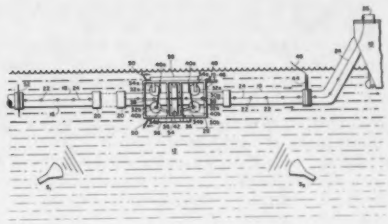
Filed Mar. 3, 1980, Ser. No. 126,589
Int. Cl.[3] H04R *29/00*
U.S. Cl. 367—13 23 Claims

1. Apparatus for determining selected parameters related to the operation of an acoustic array which contains a number of interconnected sensor elements, said apparatus comprising:

means for projecting test signals of selected acoustic frequencies;

cart means for successively bringing said projecting means into selected, closely spaced relationship with each of said sensor elements included in a length of said array, said cart means comprising a supporting frame to which said projecting means is fixably joined, and roller means for enabling said array to be moved along its centerline in relation to said cart means and said projecting means;

means for controlling the operation of said cart means; and

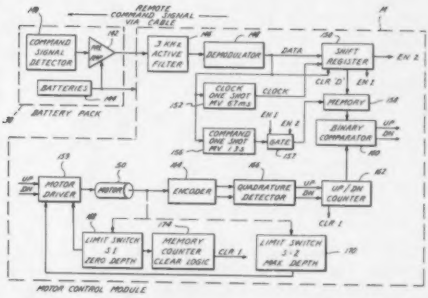


means coupled to said sensor elements for monitoring the response of a given one of said sensor elements to said test signals when said projecting means and said given sensor element are in said closely spaced relationship.

4,290,124
REMOTE CONTROL CABLE DEPTH CONTROL APPARATUS

Jimmy R. Cole, Houston, Tex., assignor to Syntron, Inc., Houston, Tex.

Filed Nov. 1, 1978, Ser. No. 956,730
Int. Cl.[3] G01V *1/38*
U.S. Cl. 367—18 4 Claims



1. A remotely controlled seismic cable depth controller having depth control vanes for controlling the depth of a seismic cable in response to digital control pulses which are modulated as a multi-bit message onto a carrier signal and sent down a wire in the seismic cable from an exploration boat, comprising:

(a) motor means for controlling the position of the depth control vanes on the controller by rotating a shaft to adjust the position of said vanes;

(b) means for receiving the modulated carrier signal, representing the desired operating depth, transmitted down the cable from the boat;

(c) filter means for filtering the data pulses from the modulated carrier signal;

(d) modulator means for extracting the data pulses of the digital control signal from said filter means;

(e) shift register means for storing the pulses of the digital control signal from said demodulator means;

(f) memory means for storing the contents of said shift register means on command;

(g) clock multivibrator means responsive to the data pulses for forming clock pulses for said shift register means;

(h) command multivibrator means responsive to a first of the data pulses for forming a signal, longer in time than the

multi-bit message, which on expiration transfers the contents of said shift register means to said memory means;

(i) encoder means for sensing rotation of said shaft by said motor means;

(j) detector means for forming pulses in response to rotation of said shaft sensed by said encoder means;

(k) counter means for storing a count representing the present operating position of said shaft which thereby represents the present operating depth of the cable;

(l) digital comparator means for comparing the digital control signal from said shift register means with the count stored in said counter means;

(m) said digital comparator means further forming depth incrementing digital pulses to compensate for differences between the digital control signal and the count stored in said counter means; and

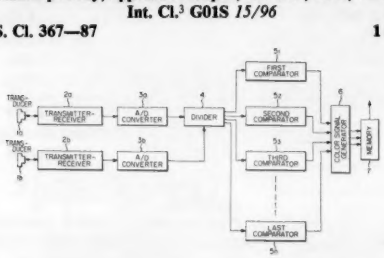
(n) motor driver circuit means for forming motor drive signals to cause said motor means to rotate said shaft and adjust the position of said vanes of the depth controller to cause the depth controller and the seismic cable to adjust operating depth in response to the digital control signal.

4,290,125

FISH DETECTOR CAPABLE OF DETECTING SPECIES OF FISH

Keisuke Honda, 62-1, Shinsanbongi, Sanbongi-cho, Toyohashi-shi, Aichi, Japan

Filed Jul. 23, 1980, Ser. No. 171,429
Claims priority, application Japan, Mar. 14, 1980, 55/31528
Int. Cl.³ G01S *15/96*
U.S. Cl. 367—87 **1 Claim**



1. A fish detector capable of detecting the species of fish CHARACTERIZED in that

two ultrasonic sounds at different frequencies are projected, their echoes are received by transmitter-receivers, respectively,

the output signals by detected echoes from said transmitter-receivers are converted into binary-coded signals,

one of said binary-coded signals is divided by the other binary-coded signal,

the ratio thus obtained is compared with a number of n reference signals at different levels, thereby detecting whether or not said ratio is greater than the reference signal at the highest level, smaller than the reference signal at the lowest level or between the reference signals at adjacent levels and subsequently displaying in color depending upon the level thus detected.

4,290,126

ULTRASONIC INTRUSION ALARM SYSTEM

Robert J. McFadyen, Syracuse, N.Y., and John F. Zeigler, III, Newtown, Conn., assignors to General Electric Company, Syracuse, N.Y.

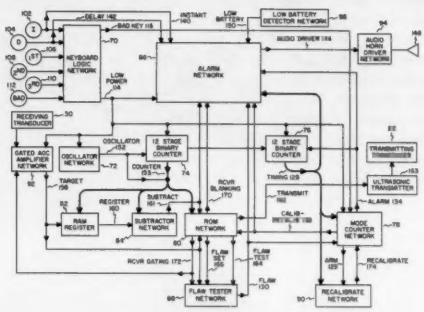
Filed Nov. 9, 1979, Ser. No. 93,100
Int. Cl.³ G08B *13/16*
U.S. Cl. 367—93 **19 Claims**

1. An intrusion alarm system wherein transmitted pulsed signals are reflected by at least one surface including a reference surface within a protected area and the resulting received pulsed signals are employed to provide an indication of an intrusion within said protected area, comprising:

(a) transmitter means for periodically transmitting said transmitted pulsed signals,

(b) gate controlled receiver means, responsive to said received pulsed signals, for generating output signals that correspond to said received pulsed signals,

(c) first means for calculating the travel time of pulsed signals between said transmitter means and receiver means and for generating first control signals as a function of said travel time of received pulsed signals,



(d) second means, responsive to said first control signals, for periodically gating on said receiver means during brief periods that coincide with the calculated arrival of pulsed signals that are reflected by said reference surface, whereby said output signals are generated only upon the gated on operation of said receiver means, and

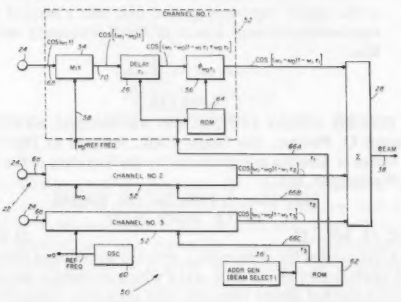
(e) third means, responsive to the output signal state of said receiver means during said brief periods, for generating an alarm signal that is indicative of an intrusion in the absence of said output signals and for preventing the generation of said alarm signal in the presence of said output signals.

4,290,127

BEAMFORMER WITH REDUCED SAMPLING RATE

Roger G. Pridham, Providence, R.I., and Ronald A. Mucci, Westwood, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 3, 1979, Ser. No. 99,386
Int. Cl.³ G01S *3/82*
U.S. Cl. 367—123 **6 Claims**



1. A beamformer comprising:

mixing means, said mixing means having terminals for receiving signals from the transducers of an array of transducers, said mixing means having terminals for receiving inphase and quadrature reference signals from a source of said inphase and quadrature reference signals, said mixing

means mixing said transducer signals with said reference signals to translate said transducer signals to a lower frequency;

phase shifter means coupled to output terminals of said mixer means for applying phase shifts to individual ones of said transducer signals;

delay means coupled to individual ones of said phase shifters for imparting delays to individual ones of said transducer signals in accordance with the times of arrival of a wavefront of radiation upon said transducers of said array, said phase shifts of said phase shifting means being proportional to said delays of said delaying means; and

means coupled to said delaying means for summing said transducer signals to form a beam.

4,290,128

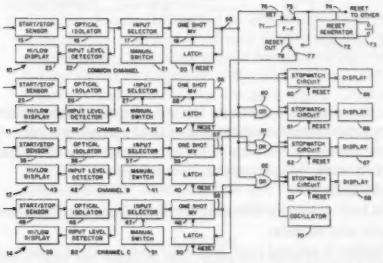
TIME SEQUENCE MONITOR

Paul S. Estabrook, R.F.D. #1, East Kingston, N.H. 03827

Filed Apr. 4, 1980, Ser. No. 137,450

Int. Cl.³ G04F *8/00*

U.S. Cl. 368—1 **8 Claims**



1. A time sequence monitor for displaying the time elapses for a sequence of functional occurrences comprising:

(a) a plurality of stopwatch circuits each having a start/stop connection and a display output connection.

(b) a plurality of display means each connected to a respective one of said stopwatch circuits to display time intervals counted thereby;

(c) a plurality of signal channels each of which comprises:

(1) a signal sensor for detecting one of said occurrences;

(2) pulse means connected to said sensor for providing an electrical pulse responsive to said sensor;

(3) latch means connected to said pulse means for latching said pulse means responsive to a pulse output of said pulse means and inhibiting further pulses; and,

(4) reset means connected to said latch means for resetting said latch to reenable said pulse means;

(d) a common connection of the pulse means of one of said signal channels to the start/stop input connection of each of said stopwatch circuits; and

(e) an individual connection from the pulse means of each of the remainder of said signal channels to one of the start/-stop inputs of a respective one of said stopwatch circuits whereby all of said stopwatch circuits can be started or stopped by one common signal channel and said stopwatch circuit can be individually started or stopped by a respective signal channel.

4,290,129

ELECTRONIC WATCH WITH SUPPLEMENTAL FUNCTION DISPLAY

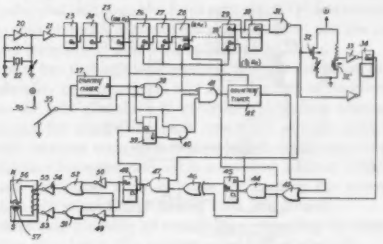
Kenichi Ushikoshi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 27, 1979, Ser. No. 61,341

Claims priority, application Japan, Jul. 27, 1978, 53-91803; Sep. 21, 1978, 53-116953

Int. Cl.³ G04B *9/00*

U.S. Cl. 368—66 **23 Claims**



1. In an electronic watch including a time-standard frequency-signal-generating means; a divider network dividing down said standard frequency signal and outputting a timekeeping signal of lower frequency; display means for indicating timekeeping functions; driving means, said driving means receiving said timekeeping output of said divider network and outputting signals to actuate said display means; an electrical power source for energizing the elements of said watch including said signal-generating means, said divider network, said display and driving means; the improvement therein comprising:

control means, said control means when enabled being adapted to pass a supplemental signal to said driving means said supplemental signal being outputted from said divider network;

detecting circuit means responsive to the voltage level of said power source, said detecting circuit means enabling said control means to pass said supplemental signal and causing said display means to output abnormal indications of said timekeeping functions when said source voltage drops below a prescribed level;

selectively actuatable preview circuit means, said preview circuit means being adapted to enable said control means and cause said abnormal indications of said timekeeping functions to occur in response to the actuation thereof when said source voltage exceeds said prescribed level.

4,290,130

DIGITAL FREQUENCY TRIMMED ELECTRONIC TIMEPIECE

John Lowdenslager, Norwalk, and Norman C. Zatsky, Southbury, both of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Dec. 21, 1979, Ser. No. 106,174

Int. Cl.³ G04B *17/12*; G04C *11/02*

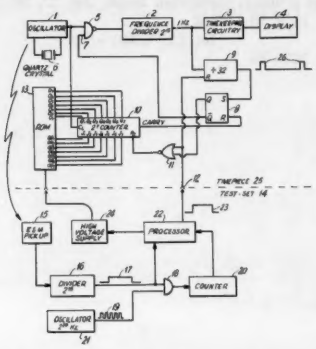
U.S. Cl. 368—200 **4 Claims**

1. In combination:

an electronic wristwatch having a quartz crystal controlled oscillator having a nominal frequency above a desired rate, a count-down circuit coupled to the oscillator to receive an input signal therefrom and provide a lower frequency output signal, time indicating means coupled to the count-down circuit to be activated thereby;

an inhibit circuit means comprising a NAND circuit connected between the oscillator and the count-down circuit, said NAND circuit blocking oscillator pulses to the count-down circuit upon an inhibit signal from a flip-flop circuit, said flip-flop circuit generates the inhibit signal in response to a periodic output signal from a divider circuit respond-

ing to signals from the count-down circuit, a nonvolatile memory circuit programmed to provide output signals indicative of a first predetermined count, a presettable counter coupled to said output signals of the memory circuit and being preset to a count equal to said first predetermined count in response to a preset enable signal from



the flip-flop circuit and thereafter rendered receptive to oscillator signals for increasing the count of said counter to a second predetermined count, said flip flop circuit being responsive to the second predetermined count from said counter to remove said inhibit signal to the NAND circuit whereby oscillator pulses are gated to the count-down circuit.

4,290,131

ELECTRONIC TIMEPIECE

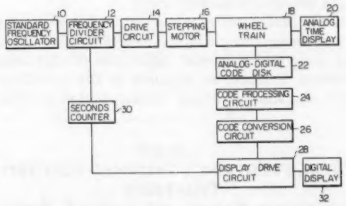
Kazunari Kume, and Hideshi Ohno, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Apr. 4, 1979, Ser. No. 26,971

Claims priority, application Japan, Apr. 6, 1978, 53-040682; May 19, 1978, 53-059657

Int. Cl.³ G04B *25/00*

U.S. Cl. 368—71 **16 Claims**



1. An analog-to-digital time data conversion system for an electronic timepiece having a source of a standard time signal, frequency divider circuit means for dividing the frequency of said standard time signal to provide a time unit signal, driver circuit means responsive to said time unit signal for producing a drive signal, electro-mechanical transducing means driven by said drive signal, a wheel train driven by said electro-mechanical transducing means for reducing the speed of movement and transmitting the mechanical displacement of said electro-mechanical transducing means, and analog time indicating means driven by said wheel train for indicating time information, comprising:

at least one coded disk coupled to said wheel train for being rotated thereby, said coded disk including a plurality of areas mutually differentiated to represent the bits of a multiple-bit digital code, adjacent groups of said areas representing code combinations of said multiple-bit digital code, and each of said code combinations representing a point in time indicated by said analog time indicating means;

means for successively detecting said code combinations as said coded disk rotates, said detection means providing a plurality of digital code signals and a transition signal;

code processing circuit means responsive to said transition signal for correcting the timing of logic level transitions of said digital code signals, to produce corrected digital code signals; and

code convertion means responsive to said corrected digital code signals for producing digital time data signals indicative of said time information.

4,290,132

FOCUS SERVO DEVICE FOR USE IN AN OPTICAL INFORMATION READ-OUT DEVICE

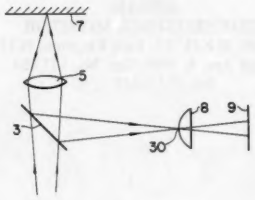
Fumitaka Kotaka, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 8, 1978, Ser. No. 904,117

Claims priority, application Japan, May 11, 1977, 52-54095; May 18, 1977, 52-57429

Int. Cl.³ G11B *7/12*

U.S. Cl. 369—45 **3 Claims**



1. A focus servo apparatus for use in optical type information read-out system, said system of the type using a recording medium having a surface bearing at least one information recording track, said apparatus comprising:

a light source;

a first lens means for focusing the light from said light source onto said surface;

a cylindrical second lens means for passing light reflected by said surface and passed through said first lens means, said cylindrical second lens means having a primary principal point and being arranged such that said primary principal point is positioned substantially at the focal point of the reflected light passed through said first lens means; and

means responsive to an output of said light receiving means for regulating the position of said first lens means so that the light from said light source is maintained in focus on the surface of said recording medium.

4,290,133

SYSTEM TIMING MEANS FOR DATA PROCESSING SYSTEM

Robert E. Stewart, Stow; Barry J. Flahive, Westford, and David Potter, Pepperell, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 845,415, Oct. 25, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,604

Int. Cl.³ H04J *3/08*

U.S. Cl. 370—85 **14 Claims**

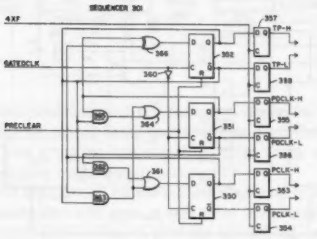
1. In a data processing system including a processor unit for processing data in response to instructions, at least one other unit for transferring data to and from said processor unit and bus means connected to the units for transferring signals among the units, the improvement of system timing means for controlling the transfer of signals among the units, said system timing means comprising:

A. clock generator means connected to said bus means for generating timing signals, said clock generator means including:

i. oscillator means for generating timing reference signals as first timing signals, and

ii. sequencer means connected to said oscillator means for transmitting a phase signal and a clocking signal in synchronism with the timing reference signals from said oscillator means, and

B. timing conductor means in the bus connected to said sequencer means in said clock generator means for coupling the phase and clocking signals to the processor and other units, and



C. timing means in each of the processor and other units for establishing internal timing for each said unit in response to the phase and clocking signals, each said timing means comprising:

i. decoding means connected to said receiving means for transmitting a sequence of unit timing signals, said decoding means including means for generating each unit timing signal in response to the phase signal and for an interval determined by the clocking signal, whereby the phase signal governs the position of the respective unit timing signals in the sequence, and the clocking signal controls the duration of each of the respective unit timing signals, the unit timing signals in a given unit controlling the functions that the unit performs.

4,290,134

MULTIPLEX INFORMATION HANDLING SYSTEM

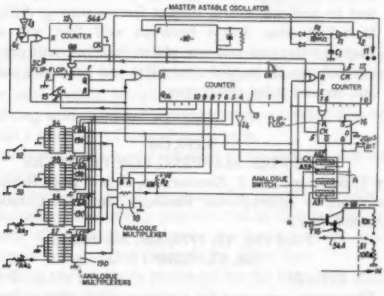
Michael J. Hampshire, Liversedge, England, assignor to Ward & Goldstone Limited, Salford, England

Filed Mar. 5, 1979, Ser. No. 17,096

Claims priority, application United Kingdom, Mar. 10, 1978, 9493/78

Int. Cl.³ H04J *6/00, 3/08*

U.S. Cl. 370—92 **26 Claims**



1. A multiplex information handling system for handling data bits, comprising:

control equipment having a state;

a plurality of transmitters, each having at least one input connected to said control equipment, each of said plurality of transmitters including generating means for generating address codes for each of said data bits, said address codes being determined by the state of, and corresponding to, said control equipment;

a plurality of receivers, each having at least one output which is connected to a corresponding load, and a respective receiver code identifying said at least one output;

signal bus means for connecting said plurality of transmitters to said plurality of receivers so as to convey said address codes and said data bits from said plurality of transmitters to said plurality of receivers as transmitted address codes and transmitted data bits, respectively; and

a power bus through which power is fed in operation to said plurality of transmitters and said plurality of receivers;

each of said plurality of receivers including comparing means for comparing each conveyed address code with said receiver code, and routing means responsive to coincidence between said each conveyed address code and said respective receiver code for routing the conveyed data bits to said identified at least one output;

each of said plurality of transmitters repeating its transmission after lapse of a predetermined time interval;

whereby any one of said corresponding loads is controlled by said control equipment at any one of said transmitter inputs, given the address code corresponding to said control equipment coinciding with said respective receiver code identifying said at least one output connected to said corresponding load.

4,290,135

CIRCUIT ARRANGEMENT FOR RECEIVING DIGITAL INTELLIGENCE SIGNALS IN A DIGITAL SWITCHING CENTER FOR PCM-TIME-DIVISION MULTIPLEX COMMUNICATION NETWORKS

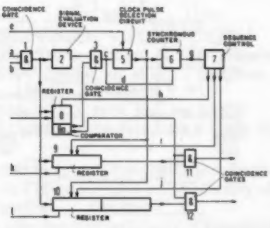
Josef Zemanek, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 4, 1979, Ser. No. 72,093

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840952

Int. Cl.³ H04J *3/12, 3/06*

U.S. Cl. 370—110 **6 Claims**



1. A circuit arrangement for the reception of digital intelligence signals in a digital switching center of a time-division communication network, which signals are transmitted on extension circuits from digital subscriber stations and are in the form of intelligence signal blocks comprising at least one intelligence signal word, and if necessary a signalling word, and a synchronizing word comprising a signal evaluation device (2) which responds to digital signals distinguishable from the quiescent condition and is insensitive to such digital signals subsequent thereto for at least for the duration of an intelligence signal block (Sy, Si, NW) and a maximum time of until the beginning of a new intelligence signal block; a clock pulse selection circuit (5) connected to said signal evaluation device and derives a plurality of bit clock pulse sequences (f) of identical frequency but phase displaced from an exchange clock

pulse (e) from the switching center and, during a synchronizing phase only passes said bit clock pulse sequence (f) which is in phase with the signal from the evaluation device (2); a synchronous counter (6) receiving the output of said clock pulse selection circuit and having a counting capacity corresponding to the length of the intelligence signal blocks which are forwarded by means of said bit clock pulse sequence (f) and said counter placed in its initial counter reading stage with a signal from the signal evaluation circuit; at least three registers (8, 9, 10) for the signal parts (Sy, Si, NW) of an intelligence signal block each connected to said incoming intelligence signal blocks and a sequence control (7) connected to said counter and deriving accept-release signals for said three registers (8, 9, 10) from the counter readings of the synchronous counter (6), a comparator (8a) which monitors the contents of one of said three registers which accepts the synchronizing word (Sy) for the occurrence of a synchronizing word and when coincidence occurs, a synchronous working phase results in which said bit clock pulse sequence (f) selected by means of the clock pulse selection circuit is retained and a zero setting of the synchronous counter is suppressed, and in the outputs of said three registers for the signalling word (9) and the intelligence signal word (10) are released, and in the case of non-coincidence, the synchronizing phase results.

4,290,136

CIRCUIT ARRANGEMENT FOR MONITORING THE STATE OF SIGNAL SYSTEMS, PARTICULARLY TRAFFIC LIGHT SIGNAL SYSTEMS

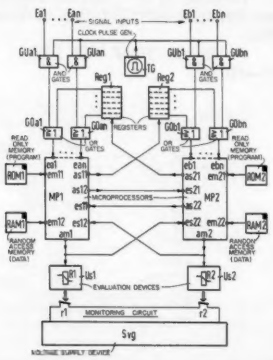
Heinrich Brunner, Rottach-Egern; Peter Drebinger; Peter Hoehne, both of Munich; Johann Hoisl, Ottobrunn; Guenter Kochanowski, Wolfratshausen, and Walter Wimmer, Pullach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 57,123

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1978, 2833761

Int. Cl.³ G06F *11/00;* **B60Q** *9/00*

U.S. Cl. 371—25 **15 Claims**



1. A circuit arrangement for monitoring the state of a signal system, comprising:

a memory means storing a plurality of test signals corresponding to inadmissible signal states;

an evaluation means including an input and an output and operable in response to a predetermined clock pulse sequence at said input to provide an output signal indicating an inadmissible actual signal state; and

signal comparison means including first inputs for receiving sequential actual state signals, second inputs connected to said memory means for receiving the test signals and an output connected to said evaluation means, and operable to sequentially compare each actual signal with all test signals and emit said predetermined clock pulse sequence in response to equality of an actual state signal and a test signal.

4,290,137

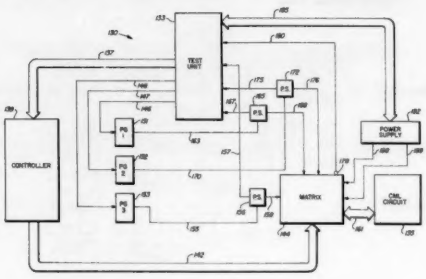
APPARATUS AND METHOD OF TESTING CML CIRCUITS

Dennis C. Hilker, Cave Creek, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 26, 1979, Ser. No. 106,573

Int. Cl.³ G01R *15/12*

U.S. Cl. 371—24 **11 Claims**



1. Test apparatus for CML integrated circuit comprising:

a. a first pulse generator capable of producing a first shaped pulse when actuated;

b. a second pulse generator capable of producing a second shaped pulse when actuated;

c. a first power splitter connected to receive said first shaped pulse and providing said first shaped pulse at two outputs thereof;

d. a second power splitter connected to receive said second shaped pulse and providing said second shaped pulse at two outputs thereof;

e. a plurality of electrically actuated relays, each relay movable between a first and second position from one electrical contact to another electrical contact in response to a switching signal, said plurality of relays being connected to said circuit, one output of said first power splitter, and one output of said second power splitter; said relays arranged in a matrix to connect said first and second shaped pulse to any pin of said circuit and provide an output waveform from any pin of said circuit at a waveform output thereof;

f. a controller connected to said relays for providing said switching signal to each relay as required; and

g. a test unit connected to other outputs of said first and second power splitters opposite to said one output thereof, and to said waveform output for measuring differences including time delays between said first and second shaped pulse and said waveform, said test unit providing control signals to said controller and actuating said first and second pulse generators.

4,290,138

WIRE FIRE MAPPING FOR PRINTERS

Gary T. Bare, and Lee T. Zimmerman, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1979, Ser. No. 86,383

Int. Cl.³ G06F *11/32*

U.S. Cl. 371—29 **3 Claims**

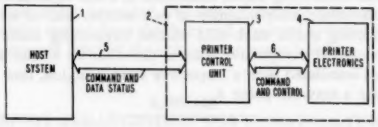
1. Diagnostic apparatus for a printer unit having at least one print head, said print head having a plurality of print wires and actuators arranged in a nonconventional print wire pattern, such as a slanted serrated pattern, said diagnostics comprising:

selection means to select a plurality of diagnostic test opera-

tions for said printer unit, including a wire fire mapping test operation;

storage means for storing print wire images for test purposes; and

wire fire mapping means operable responsive to said selection means when the wire fire mapping test operation is selected for entering test data representative of a predetermined test pattern in said storage means and for supplying actuating signals to said print wire actuators in accordance



with said predetermined test pattern to display on a record medium the actual firing and misfiring condition of said print wire actuators and associated print wires, said wire fire mapping means incorporating

head/wire designation means for entering data in said storage means that will actuate said print wire actuators and associated print wires to provide identifying indicia on said record medium indicative of the print heads and print wires in order that wire firings and misfirings may be readily diagnosed.

4,290,139

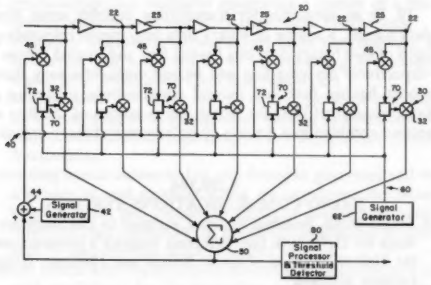
SYNCHRONIZATION OF A DATA COMMUNICATION RECEIVER WITH A RECEIVED SIGNAL

Dale M. Walsh, West Redding, Conn., assignor to General Data-Comm Industries, Inc., Danbury, Conn.

Filed Dec. 22, 1978, Ser. No. 972,445

Int. Cl.³ H04B *3/04*

U.S. Cl. 375—14 **10 Claims**



5. A method of achieving synchronization between a receiver and a data communication signal received by said receiver, said method comprising the steps of:

applying said received signal to a tapped delay line which has a plurality of spaced apart taps;

sequentially shifting said received signal through said tapped delay line;

multiplying the signals at each of a plurality of taps with signals approximately proportional to the complex conjugate of a plurality of signals in a portion of the received signal being shifted through the delay line;

summing the products produced by the foregoing multiplication step; and

producing an output signal representing the detection of said plurality of signals in the received signal when the signal produced in the foregoing summing step meets a prespecified criterion.

4,290,140

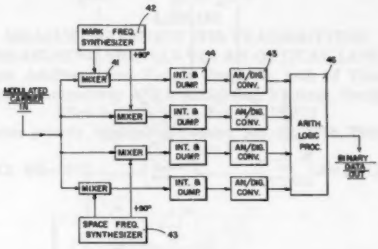
COMBINED COHERENT FREQUENCY AND PHASE SHIFT KEYING MODULATION SYSTEM

Robert Malm, Pacific Palisades, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 880,631, Feb. 23, 1978, abandoned. This application Jun. 21, 1979, Ser. No. 50,795

Int. Cl.³ H04L *27/18, 27/10*

U.S. Cl. 375—46 **6 Claims**



1. A system for use in the modulation of binary digital data on an electromagnetic carrier and the demodulation of said data from said carrier, comprising:

modulator means for effecting both coherent frequency and phase shift keying of said carrier in accordance with said data,

first demodulator means for quasi-CPSK demodulating the phase shifted carrier components representing the data from said carrier,

second demodulator means for NCFSK demodulating the frequency shifted carrier components representing the data from said carrier,

error predictor means for determining when said first or second demodulator means has an unacceptable error rate, and

means responsive to said error predictor means for selecting the output of the other one of said demodulating means as the demodulated output of said system whenever the current demodulating means has an unacceptable error rate.

4,290,141

ELECTRONIC VOTING SYSTEM

Roy E. Anderson, Scotia; Richard L. Frey, Schenectady, and James R. Lewis, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 2, 1979, Ser. No. 53,767

Int. Cl.³ H04B *17/00;* H04J *3/14;* G09B *7/06*

U.S. Cl. 455—2 **19 Claims**

17. A method for voting to determine the collective response of an audience to a given stimulus with a plurality of suggested responses comprising:

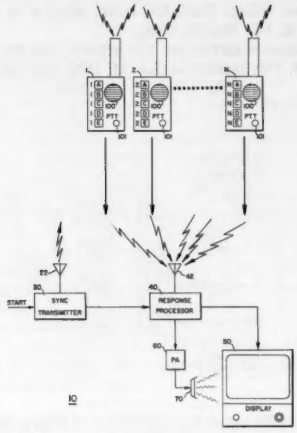
presenting a stimulus with a plurality of suggested responses to said audience;

transmitting, from each member of said audience, an individually selected one of a plurality of different digitally coded signals modulated on an electromagnetic carrier wave of predetermined frequency, each of said digitally coded signals corresponding to a different one of said suggested responses, each digitally coded signal being transmitted during a different one of a plurality of sequential time intervals of predetermined duration, respectively;

receiving said digitally coded signals;

correlating the received digitally coded signals with the suggested responses represented thereby so as to generate a logic signal at one of a plurality of logic ports each time one of said digitally coded signals is received that corresponds to the suggested response represented by that respective logic port;

counting the number of logic signals generated at each of said logic ports, and



displaying data representative of the number of logic signals generated which correspond to each of the suggested responses, such that the total number of each of said suggested responses by the audience may be ascertained.

4,290,142
INTERACTIVE CABLE TELEVISION SYSTEM

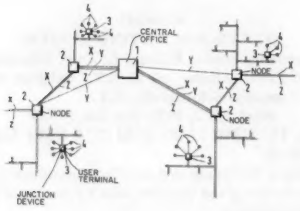
Rolf Schnee; Franz Kraus; Friedrich Kiel; Helmut Kliem; Wolfgang Krick, all of Berlin, and Herbert Landgraf, Darmstadt, all of Fed. Rep. of Germany, assignors to Heinrich-Hertz-Institut für Nachrichtentechnik Berlin GmbH, Berlin, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 14,282

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807986

Int. Cl.³ H04B *3/04*

U.S. Cl. 455—3 **6 Claims**



1. In an interactive cable television system for serving a plurality of user locations in a service area divided into a plurality of service regions, including a central office and a service network having a portion composed of parallel cables arranged in a tree pattern possessing a plurality of nodes connected to said central office and remote from the user locations and, in the vicinity of the users, a further portion composed of transmission cables connected to groups of user locations, which transmission cables being connected to each group in a star pattern, the system presenting a plurality of transmission paths and means permitting multiple utilization of the paths, the improvement wherein: in each said service region said service parallel cables of said first mentioned portion of said network are connected in a tree structure extending from one of said node toward said user locations and are constituted by two parallel autonomous sets of cables thus representing network planes B, C and D; said service network further comprises, in each said service region, a plurality of junction devices each connected to said parallel cables of network plane D at the outer end of a respective branch of said tree structure and to said transmission cables which represent a network plane E of a respective group of user locations; and said service network further comprises a first connecting cable which is common to all of said nodes and connected in a tree structure between said central office and all of said nodes, said first cable being connected at said nodes to one of said sets of cables, and second connecting cables connected in a star structure to said central office independently of one another and of said first connecting cable, each said second connecting cable being connected at a respective node to the other set of said parallel cables associated with a respective service region, thus representing a network plane A.

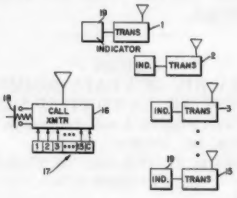
4,290,143
TRANSMISSION METHOD AND APPARATUS WHEREIN BINARY DATA BITS ARE CONVERTED INTO BARKER WORDS AND VICE VERSA

F. A. Wissel, and D. A. Kiliman, both of Cincinnati, Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Apr. 19, 1979, Ser. No. 31,457

Int. Cl.³ H04L *3/00*; H04B *3/60, 12/02*

U.S. Cl. 455—38 **26 Claims**



10. In an apparatus for transmitting multibit serial binary data signals, a source of binary data bits, means responsive to each of said binary data bits having first and second values for respectively deriving first and second multi-bit binary Barker words having first and second combinations including the same number of bits, the bits in like positions of the first and second combinations having complementary binary values.

4,290,144
RADIO COMMUNICATIONS SYSTEMS

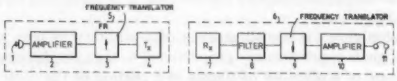
J. Stuart Webb, Reading, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jan. 22, 1980, Ser. No. 114,170

Claims priority, application United Kingdom, Jan. 22, 1979, 02296/79

Int. Cl.³ H04B *1/00*

U.S. Cl. 455—63 **3 Claims**



1. A radio communications system for aircraft, for use in improving speech communication between aircraft travelling at high speed and low level where rapid phase and amplitude fluctuations degrade intelligible speech transmission, comprising a transmitter carried in a first aircraft, said transmitter including

a microphone and an upshift frequency translator connected to receive an input signal from said microphone and arranged to transfer the frequency band of said input signal to a higher band, and an amplitude modulator connected to receive frequency translated signals from the upshift translator and arranged to modulate said frequency signals,

and a receiver carried in a second aircraft arranged to receive said modulated signals from the transmitter, said receiver including

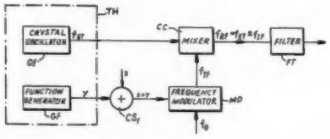
a demodulator for demodulating the received signals,

a high pass filter for removing noise from the demodulated signal, and a downshift frequency translator connected to receive output from the filter and arranged to transfer the frequency band of the output to a lower band.

4,290,145
CIRCUIT ARRANGEMENT FOR COMPENSATING TEMPERATURE-DEPENDENT FREQUENCY VARIATIONS OF A CRYSTAL-CONTROLLED OSCILLATOR

Manlio Saba, and Roberto Szocs, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Jun. 11, 1980, Ser. No. 158,509
Claims priority, application Italy, Jun. 12, 1979, 23479 A/79
Int. Cl.³ H04B *1/04*
U.S. Cl. 455—113 **7 Claims**



1. In a message-transmitting system using frequency modulation, in combination:

a crystal-controlled oscillator generating a carrier of a frequency subject to temperature-dependent fluctuations;

a frequency modulator having a first input for receiving a subcarrier and a second input for receiving a message signal to be modulated upon said subcarrier;

a function generator in the vicinity of said oscillator emitting a corrective signal of a magnitude varying as a function of temperature related to the temperature dependence of said fluctuations;

summing means connected to said function generator and to a source of said message signal for supplying the latter together with said corrective signal to said second input whereby said subcarrier is frequency-modulated by the sum of said message and corrective signals;

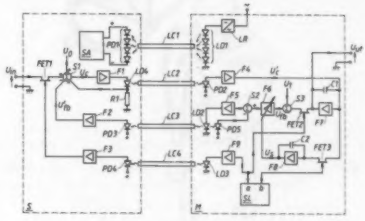
mixer means with input connections to said oscillator and to said modulator for heterodyning said carrier with the frequency-modulated subcarrier to produce a pair of sidebands respectively representing the sum and the difference of said carrier and subcarrier, the temperature-dependent fluctuations of said carrier being substantially compensated by the corrective modulation of said subcarrier in one of said sidebands; and

filter means downstream of said mixer means for suppressing the other of said sidebands.

4,290,146
MEASURING DEVICE FOR TRANSMITTING MEASURING SIGNALS VIA AN OPTICAL LINK

Morgan Adolfsson, and Torgny Brogardh, both of Västeras, Sweden, assignors to ASEA Aktiebolag, Västeras, Sweden

Filed Sep. 17, 1979, Ser. No. 75,873
Claims priority, application Sweden, Sep. 22, 1978, 7809961
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—612 **11 Claims**



1. In a measuring device of a type having a transmitter side and a receiver side, the transmitter side receiving at least one input measurement signal and transmitting the at least one input measurement signal over an optical link to the receiver side, the improvement comprising:

comparing means on said transmitter side for receiving the at least one measurement signal and a feedback signal from said receiver side and generating a corresponding comparison signal having an amplitude that is a function of the magnitude of the measurement signal and the received feedback signal;

first optical transmission link means for transmitting said comparison signal from the transmitter side to the receiver side;

regulator means with integrating characteristic on said receiver side for receiving the transmitted comparison signal and for generating a feedback signal having a magnitude corresponding to the magnitude of the measurement signal; and

second optical transmission link means for transmitting the feedback signal from the receiver side to the transmitter side in the form of a light signal, the light intensity of which is a direct measure of said feedback signal.

DESIGNS

SEPTEMBER 15, 1981

260,695

BABY CARRYING GARMENT

Helen K. Brookfield, 36 Moorhouse St., Camberwell East, Victoria, Australia (3124)

Filed Feb. 27, 1979, Ser. No. 15,879

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—190

260,696

COMBINED BLADE AND CARRYING CASE FOR HERBS

Henry L. Madden, 5056 Saratoga, San Diego, Calif. 92107

Filed Dec. 21, 1978, Ser. No. 967,141

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D3—30

260,697

BACK PACK

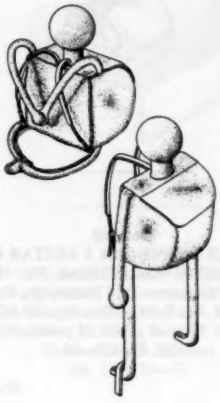
Susan A. Fitzgerald, and Russell B. Watson, Jr., both of 1000 Sansome St., Third Flr., San Francisco, Calif. 94111

Filed Nov. 19, 1979, Ser. No. 95,601

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D3—32



260,698

BACK PACK

Susan A. Fitzgerald, and Russell B. Watson, Jr., both of 1000 Sansome St., Third Floor, San Francisco, Calif. 94111

Filed Nov. 30, 1979, Ser. No. 98,877

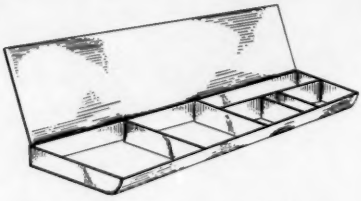
Term of patent 14 years

Int. Cl. D3—*01*

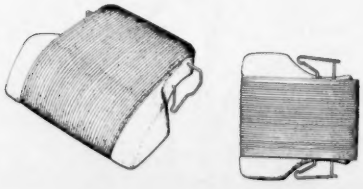
U.S. Cl. D3—32

260,699
KEY HOLDER
Abel Yu, 974 W. Kensington Rd., Los Angeles, Calif. 90026
Filed Jun. 25, 1979, Ser. No. 52,000
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—65

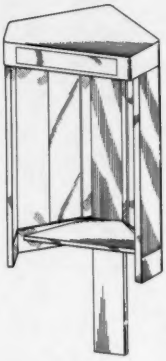
260,700
COMPARTMENT FOR A GUITAR CASE
Joseph Patrick, 107 S. Ave., Clairton, Pa. 15025, and Tim DeMurry, 1837 Greentree Rd., Pittsburgh, Pa. 15220
Filed Jul. 7, 1978, Ser. No. 923,047
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74



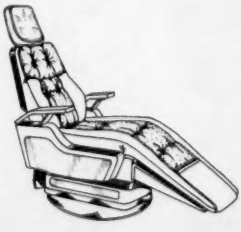
260,701
AUXILLARY AUTOMOBILE SEAT FOR A CHILD
Kjell O. Jonasson, Gothenburg, Sweden, assignor to Aktiebolaget Volvo, Gothenburg, Sweden
Filed Oct. 30, 1978, Ser. No. 956,228
Claims priority, application Sweden, May 2, 1978, 78-1196
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—9



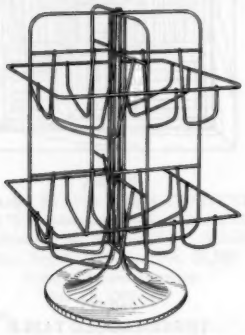
260,702
OUTDOOR TELEPHONE BOOTH
Leslie A. Hannula, Waukegan, and Fred L. Browning, Hanover Park, both of Ill., assignors to Acoustics Development Corporation, Northbrook, Ill.
Filed Jun. 18, 1979, Ser. No. 49,109
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D6—20



260,703
DENTAL CHAIR
Harold B. Pearson, West Des Moines, Iowa, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Jan. 19, 1979, Ser. No. 4,700
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22



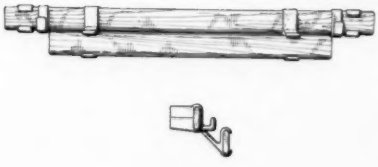
260,704
ROTATABLE DISPLAY STAND
Howard Nathan, New York; Sydney Edson, East Meadow, and Fred Howard, New York, all of N.Y., assignors to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jan. 28, 1980, Ser. No. 115,912
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



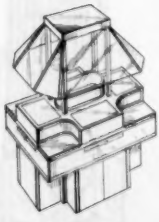
260,705
FOLDABLE COMBINATION CHAIR AND TABLE
Jose A. Zamora, 5046 W. 46th Ave., Denver, Colo. 80212
Filed Aug. 9, 1979, Ser. No. 65,125
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—64

260,706
UPHOLSTERED CHAIR
Otto Zapf, Königstein, Fed. Rep. of Germany, assignor to Drabert Sohne Minden (Westf.), Minden, Fed. Rep. of Germany
Filed Jul. 2, 1979, Ser. No. 53,866
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

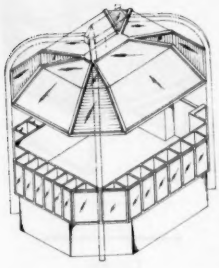
260,707
DOUBLE-BARRED TOWEL HOLDER
Didier Deconinck, Seyssins, France, assignor to Allibert Exploitation Societe Anonyme, Isere, France
Filed Nov. 21, 1979, Ser. No. 96,446
Term of patent 3½ years
Int. Cl. D23—*02*
U.S. Cl. D6—99



260,708
SALAD BAR
James C. Schindler, Naperville, Ill.; Richard Hoeft, III, Santa Barbara, Calif., and Joan Grez, La Grange, Ill., assignors to McDonald's Corporation, Oak Brook, Ill.
Filed Apr. 20, 1979, Ser. No. 31,954
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—144

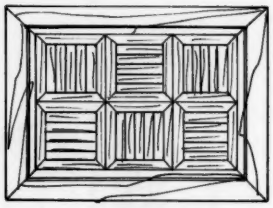


260,709
KIOSK
R. Michel Perlmutter, Aurora, Colo., assignor to Grove Foods, Inc., Aurora, Colo.
Filed Oct. 25, 1979, Ser. No. 84,895
Term of patent 14 years
Int. Cl. D6—*04*; D25—*03*
U.S. Cl. D6—146

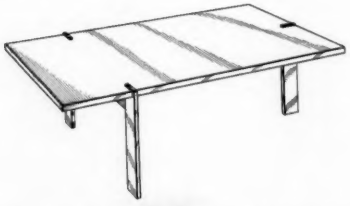


260,710
GUN CABINET
Arlie D. Miller, 4622 Anetta, Midland, Tex. 79703
Filed May 1, 1979, Ser. No. 34,983
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—149

260,711
END TABLE
Jobie G. Redmond, High Point, N.C., assignor to Jack Daniel Distillery, Lems Motlow Prop., Inc., Lynchburg, Tenn.
Filed Nov. 8, 1978, Ser. No. 958,850
The portion of the term of this patent subsequent to Jan. 20, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

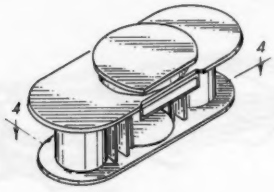


260,712
THREE-LEGGED TABLE
James Potucek, 330 E. 54th St., New York, N.Y. 10022
Filed Jul. 25, 1979, Ser. No. 60,832
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

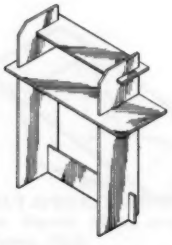


260,713
FOUR-LEGGED TABLE
James Potucek, 330 E. 54th St., New York, N.Y. 10022
Filed Jul. 25, 1979, Ser. No. 60,833
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

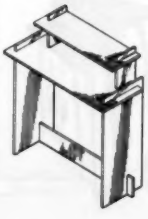
260,714
TABLE
Robert A. Philpot, 1048 Prep St., Augusta, Ga. 30901
Filed Jul. 19, 1978, Ser. No. 925,985
Term of patent 14 years
Int. Cl. D06—*03*
U.S. Cl. D6—179



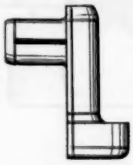
260,715
SUPPORT STAND FOR A COMPUTER
Steve J. Cohen, 175 Maribeau Sq. NW., Atlanta, Ga. 30327, and Cory W. Hillebrand, 1562 Beechcliff Dr., Atlanta, Ga. 30329
Filed Jun. 4, 1979, Ser. No. 45,250
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



260,716
SUPPORT STAND FOR A COMPUTER
Steve J. Cohen, 175 Maribeau Sq. NW., Atlanta, Ga. 30327, and Cory W. Hillebrand, 1562 Beechcliff Dr., Atlanta, Ga. 30329
Filed Oct. 10, 1979, Ser. No. 83,391
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



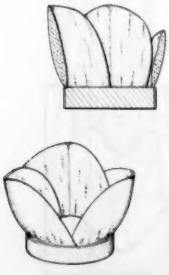
260,717
SHELF SUPPORT
Walter Gusdorf, Creve Coeur, Mo., assignor to Gusdorf Corporation, St. Louis, Mo.
Filed Apr. 12, 1979, Ser. No. 29,455
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191



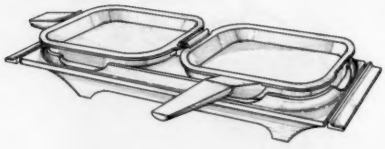
260,718
IMAGE FRAME
Joel C. Huck, P.O. Box 22544, Houston, Tex. 77027
Filed Oct. 26, 1978, Ser. No. 954,910
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

260,719
KETTLE
Toshio Otake, Yoshida, Japan, assignor to Yoshikawa Metal Ware Kabushiki Kaisha, Japan
Filed Feb. 8, 1980, Ser. No. 119,801
Claims priority, application Japan, Aug. 23, 1979, 54-035504
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—60

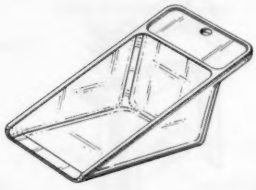
260,720
WINE CHILLER
William A. Edwards, 17200 Ceredo Pl., Granada Hills, Calif. 91344
Filed Jul. 26, 1979, Ser. No. 61,074
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—70



260,721
COMBINED, INTERLOCKING SKILLETS AND HEATING TRAY
Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 21, 1977, Ser. No. 862,724
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—87



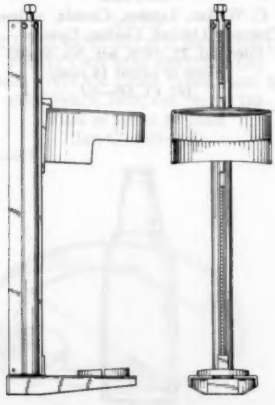
260,722
SCOOP OR THE LIKE
Robert F. Bateman, Greenville, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 21, 1980, Ser. No. 142,289
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—104



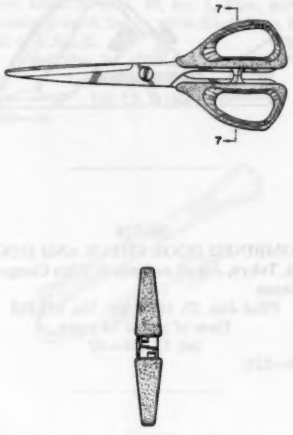
260,723
BARBECUE DEVICE
Henry H. Schifter, and Kenneth B. Briegleb, both of El Mirage, Calif., assignors to El Mirage Cooker Company, Adelanto, Calif.
Filed Nov. 6, 1978, Ser. No. 958,111
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—108

260,724
GARDEN IMPLEMENT
Eli J. Bennett, Belle Meade Ranch, Hagerman, Id. 83332
Filed May 19, 1980, Ser. No. 151,123
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—12

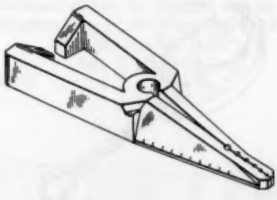
260,725
STRUT SPRING COMPRESSOR
David S. Kemmer, Warren, Mich., assignor to Kent-Moore Corporation, Warren, Mich.
Filed Jan. 22, 1979, Ser. No. 5,345
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



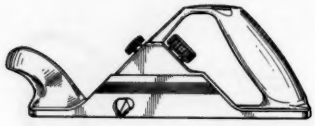
260,726
SCISSORS
Katsunori Ishii, Seki, Japan, assignor to Kai, Cutlery Center Co., Ltd., Seki, Japan
Filed Jan. 24, 1979, Ser. No. 6,123
Claims priority, application Japan, Aug. 12, 1978, 53-34436
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—57



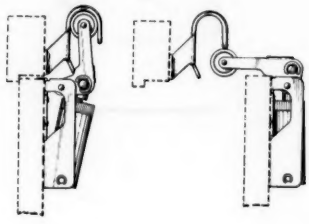
260,727
NAIL HOLDER
Robert F. West, West Simbury, and Francis W. MacGregor, New Britain, both of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Jan. 22, 1979, Ser. No. 5,376
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—72



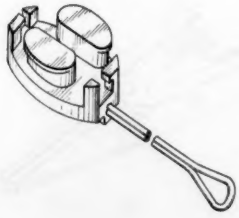
260,728
PLANE
Carl A. Breger, Malmö, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden
Filed Sep. 29, 1977, Ser. No. 838,117
Claims priority, application Sweden, Mar. 29, 1977, 77/700
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—101



260,729
COMBINED DOOR CHECK AND HOOK
Kazuo Iseki, Tokyo, Japan, assignor to Ohta Company Limited, Tokyo, Japan
Filed Jun. 27, 1978, Ser. No. 919,515
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331



260,730
CABLE CLAMP
Yoshinari Fujita, Kodairashi, Japan, assignor to Okura Electric Industry Co., Ltd., Tokyo, Japan
Filed Nov. 1, 1978, Ser. No. 956,678
Term of patent 7 years
Int. Cl. D8—*396, 08*
U.S. Cl. D8—356



260,731
COMBINED TOY FIGURE AND CONTAINER THEREFOR
George B. Sarac, 7600 Klingston St. NW., Massillon, Ohio 44646
Filed May 7, 1979, Ser. No. 36,421
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—307

260,732
BOTTLE
Richard W. C. Walker, London, Canada, assignor to Labatt Brewing Company Limited, London, Canada
Filed Jul. 27, 1979, Ser. No. 61,403
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

260,733

COMBINED BOTTLE AND CAP

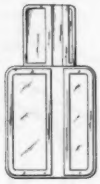
Richard E. Meyer, Chicago, Ill., and Pierre Dinand, Levallios, France, assignors to Jovan, Inc., Chicago, Ill.

Filed May 29, 1979, Ser. No. 42,933

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—367



260,734

BOTTLE

Arnold I. Frumin, and Frank B. Hedges, both of 64 Grant Ave., Carteret, N.J. 07008

Filed Jun. 16, 1978, Ser. No. 916,306

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—373

260,735

COMBINED POURING SPOUT, BRUSH WIPER AND PAINT CAN RIM PROTECTOR

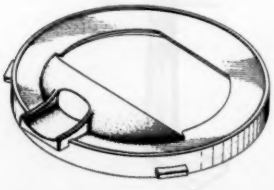
Victor E. Heath, 17476 Via Lindo, Tustin, Calif. 92680

Filed Feb. 9, 1979, Ser. No. 10,744

Term of patent 14 years

Int. Cl. D09—*99*

U.S. Cl. D9—447



260,736

PORTABLE RADAR-TYPE SPEED METER

Viktor A. Petrovsky, ulitsa Pugacheva, 19a, kv. 49; Lev G. Gassanov, ulitsa Uritskogo, 25, kv. 65, both of Kiev; Sergei M. Belyaev, ulitsa Magnitogorskaya, 3, kv. 97; Lev A. Kochetov, ulitsa Khersonskaya, 3, kv. 30, both of Moscow; Vitaly L. Kryzhanovsky, ulitsa Transheinaya, 11, kv. 1, Kiev; Andrei A. Palamarchuk, ulitsa Saratovskaya, 49, kv. 18, Kiev; Viktor D. Ushakov, ulitsa D. Bednogo, 25, kv. 52, Kiev; Rafail J. Timraleev, ulitsa Levanevskogo, 4, kv. 43-2, Kiev; Vitaly M. Parfenjuk, ulitsa Geroev Sevastopolya, 33, kv. 55, Kiev; Alexandr S. Pilipenko, ulitsa Kablukova, 3, kv. 29, Kiev; Petr A. Goncharov, ulitsa Artema, 10, kv. 1, Kiev, and Anatoly I. Ponomarenko, poselok Bucha, ulitsa Kochubeya, 8, Kieyskaya oblast, all of U.S.S.R.

Filed Mar. 23, 1979, Ser. No. 23,285

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—46

260,737

HOUSING FOR AN ELECTRONIC THERMOMETER

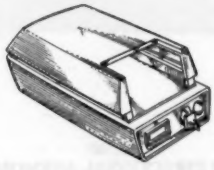
Joseph J. Manno, La Jolla, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Aug. 13, 1979, Ser. No. 66,233

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—57



260,738

CARPENTERS' LAY-OFF TAPE

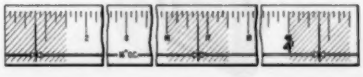
Floyd A. Smith, P.O. Box 192, Clayton, Ind.

Continuation-in-part of Ser. No. 819,206, Jul. 26, 1977. This application Dec. 27, 1977, Ser. No. 865,047

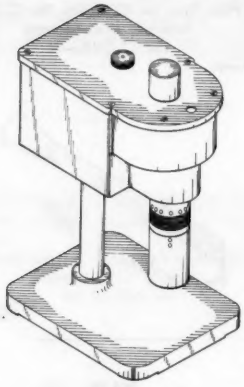
Term of patent 14 years

Int. Cl. D10—*04*

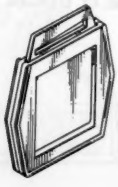
U.S. Cl. D10—71



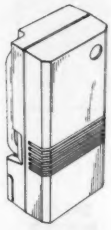
260,739
VISCOMETER
Peyton N. Randolph, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.
Filed Nov. 19, 1979, Ser. No. 95,364
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—83



260,740
HAND HELD DIRECTIONAL ANEMOMETER OR SIMILAR APPARATUS
Wayne K. Pfaff, 1316 Savannah, Irving, Tex. 75062
Filed Jul. 30, 1979, Ser. No. 61,675
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96

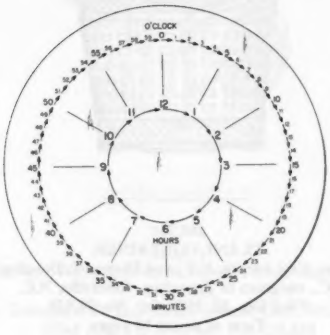


260,741
PORTABLE DOOR ALARM
Yanta H. T. Lam, Kowloon, Hong Kong, assignor to Meyer Aluminium Limited, Kowloon, Hong Kong
Filed Jun. 25, 1979, Ser. No. 52,017
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



260,742
ROAD HAZARD MARKER
Jerrold Mihailoff, 22 Greengate Rd., Don Mills, Ontario, Canada (M3B 1E8)
Filed Jul. 28, 1978, Ser. No. 929,206
Claims priority, application Canada, Feb. 3, 1978, 0302787
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—109

260,743
CLOCK FACE
John L. Haller, 7249 Carrizo Dr., La Jolla, Calif. 92037
Filed Feb. 7, 1979, Ser. No. 10,161
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126



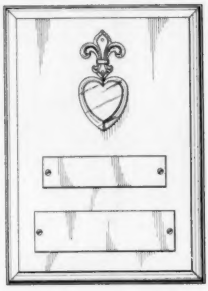
260,744
EARRING PENDANT
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 12, 1979, Ser. No. 74,891
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—43

260,745
JEWELED GOLF CLUB PIN
Leif Klatzkow, Vasaplatsen 2, S-411 34 Goteborg, Sweden, and Gosta O. Bergholtz, Gothenburg, Sweden, assignors to Leif Klatzkow, Goteborg, Sweden
Filed Jun. 8, 1979, Ser. No. 46,614
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—48

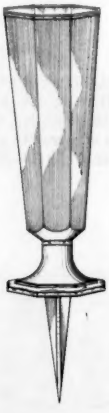
260,746
ORNAMENTAL RAZOR BLADE PENDANT
William E. Tella, 731 Central Ave., Johnston, R.I. 02919
Filed Aug. 27, 1979, Ser. No. 70,305
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

260,747
STAND FOR A TROPHY OR SIMILAR ARTICLE
Frank Malina, 2832 S. Harding Ave., Chicago, Ill. 60623
Filed Mar. 18, 1980, Ser. No. 131,419
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

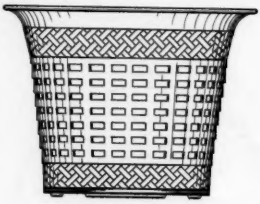
260,748
ARTIFACT PLAQUE
Sylvester Buschmann, Vienna, Mo. 65582
Filed Nov. 29, 1979, Ser. No. 98,646
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—133



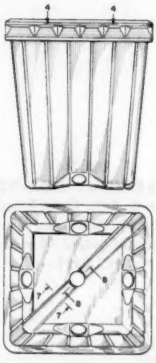
260,749
GROUND INSERTED FLOWER VASE
Richard W. Murphy, 17846 San Clemente St., Fountain Valley, Calif. 92708
Filed Apr. 6, 1979, Ser. No. 27,745
Term of patent 14 years
Int. Cl. D11—*02;* D7—*01*
U.S. Cl. D11—146



260,750
FLOWER POT HOLDER
Richard W. Murphy, 17846 San Clemente St., Fountain Valley, Calif. 92708
Filed Jun. 7, 1979, Ser. No. 46,226
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D11—153

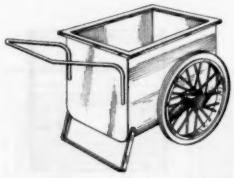


260,751
PLANT CONTAINER
Norman Lee, East Aurora, N.Y., and Thomas E. Douglas, Reidsville, N.C., assignors to Zarn, Inc., Reidsville, N.C.
Filed Sep. 10, 1979, Ser. No. 73,671
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155

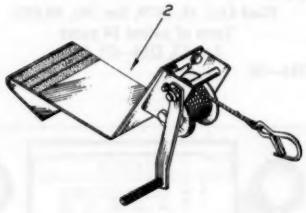


260,752
HANGING ORNAMENT OR THE LIKE
Gary A. Huntsman, and Patricia E. Huntsman, both of 2341 Woodland Ave., San Jose, Calif. 95128
Filed Apr. 17, 1978, Ser. No. 896,781
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

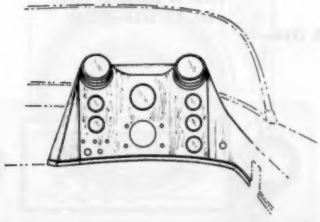
260,753
CART FOR FIREWOOD OR THE LIKE
Morris Partain, 1403 Circle Dr., Cooper, Tex. 75432
Filed Feb. 21, 1979, Ser. No. 13,061
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—32



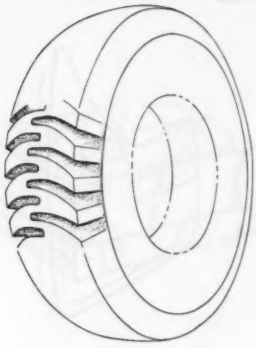
260,754
COMBINED WINCH AND SUPPORT FOR SECURING A LADDER
Ray A. Gunnels, P.O. Box 12406, Fresno, Calif. 93777
Filed Aug. 17, 1978, Ser. No. 934,640
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—54



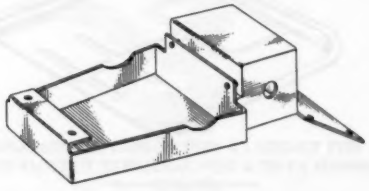
260,755
SKI BOAT CONSOLE
Robert L. Shirley, Maryville, Tenn., assignor to Master Craft Boat Company, Maryville, Tenn.
Filed Aug. 15, 1977, Ser. No. 824,967
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—317



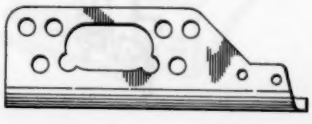
260,756
DESIGN FOR A TIRE TREAD AND BUTTRESS
Eathel L. Duncan, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Feb. 5, 1979, Ser. No. 9,006
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



260,757
MOTORCYCLE CARRYING TRAY
Gerard R. Garra, and Jon S. Parisena, both of 627 Moran St., Reno, Nev. 89502
Filed Nov. 13, 1979, Ser. No. 93,387
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

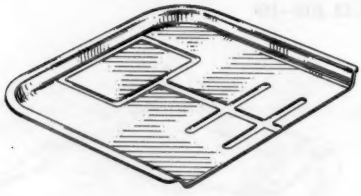


260,758
UNIVERSAL AIR CHAMBER MOUNTING BRACKET
Dennis A. Borugian, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Aug. 21, 1978, Ser. No. 935,235
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D12—180



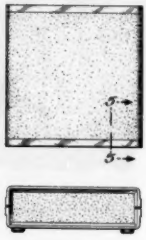
260,759
MUD FLAP
Knut Arenhold, Westend 7, 2000 Hamburg 52, Fed. Rep. of Germany
Filed Jul. 16, 1979, Ser. No. 57,682
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 66 MR 238/79
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185

260,760
SUPPORT PAN FOR A VEHICLE BATTERY
Clarence R. Sybert, Jr., 3651 Alafaya Trail, Oviedo, Fla. 32765
Filed Apr. 9, 1979, Ser. No. 28,514
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D13—10

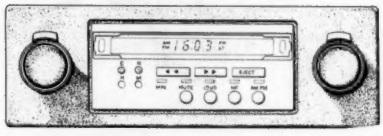


260,761
HEAT SINK OR SIMILAR APPARATUS
David H. Kennington, Highland Park, Tex., assignor to Thermalloy Incorporated, Dallas, Tex.
Filed Oct. 22, 1979, Ser. No. 86,632
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—23

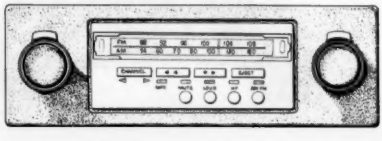
260,762
ELECTRONIC INSTRUMENT HOUSING
Peter A. Peroni, Pottstown, Pa., assignor to LaFrance Corporation, Philadelphia, Pa.
Filed Feb. 15, 1979, Ser. No. 12,437
Term of patent 14 years
Int. Cl. D13—*03;* D14—*02*
U.S. Cl. D13—41



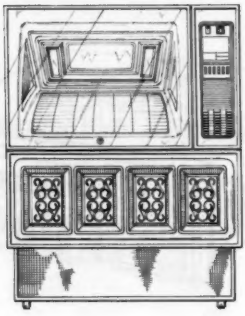
260,763
CONTROL UNIT FOR A COMBINED AUTOMOBILE CASSETTE PLAYER, RADIO AND DIGITAL CLOCK
John F. Castagna, Brooklyn, and Ronald A. Emmerling, New City, both of N.N.Y., assignors to Sparkomatic Corporation, Milford, Pa.
Filed Oct. 15, 1979, Ser. No. 85,032
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—10



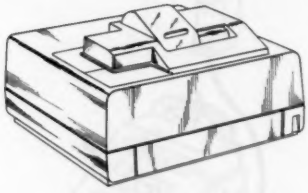
260,764
CONTROL UNIT FOR A COMBINED AUTOMOBILE CASSETTE PLAYER AND RADIO
John F. Castagna, Brooklyn, and Ronald A. Emmerling, New City, both of N.Y., assignors to Sparkomatic Corporation, Milford, Pa.
Filed Oct. 15, 1979, Ser. No. 85,033
Term of patent 14 years
Int. Cl. D14—*01, 03*
U.S. Cl. D14—10



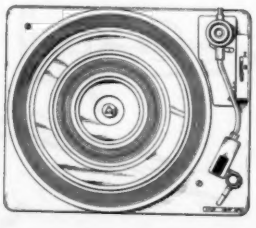
260,765
PHONOGRAPH
Melvin H. Boldt, Glenview, Ill., assignor to Rowe International, Inc., Grand Rapids, Mich.
Filed Aug. 21, 1978, Ser. No. 935,324
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—15



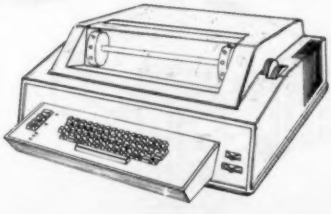
260,767
STORE TERMINAL
Roger C. Williams, Raleigh, N.C., assignor to International Business Machines Corp., Armonk, N.Y.
Filed Dec. 19, 1978, Ser. No. 971,145
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100



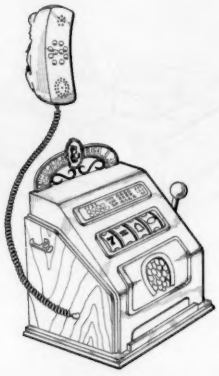
260,766
RECORD TURNTABLE
Raymond Vachus, Yzeure, France, assignor to Thomson-Brandt, Paris, France
Filed Jun. 4, 1979, Ser. No. 44,889
Claims priority, application France, Feb. 5, 1979, 77,277
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—25



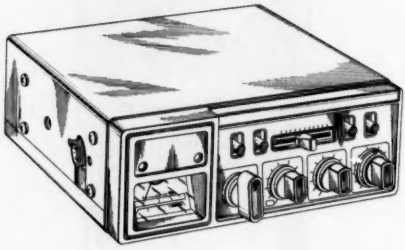
260,768
ORNAMENTAL DESIGN FOR A CABINET FOR AN INPUT-OUTPUT TERMINAL FOR A DATA HANDLING SYSTEM
Bruce B. Campbell, Chesapeake, and Charles E. Milliser, Waynesboro, both of Va., assignors to General Electric Company, Waynesboro, Va.
Filed Dec. 28, 1978, Ser. No. 974,277
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100



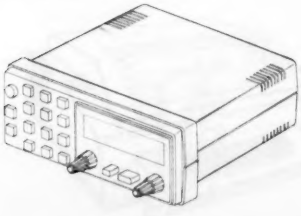
260,769
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed May 7, 1979, Ser. No. 36,595
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



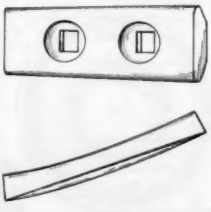
260,771
CITIZENS' BAND TRANSCEIVER OR SIMILAR ARTICLE
Andrew Kainass, Syracuse, N.Y., assignor to General Electric Company, New York, N.Y.
Filed Dec. 13, 1979, Ser. No. 103,386
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



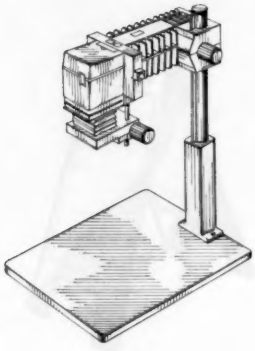
260,770
COMBINED VEHICULAR RADIO RECEIVER AND TELEPHONE DIALING PAD
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 24, 1979, Ser. No. 78,174
Claims priority, application Japan, Apr. 13, 1979, 54-014623
Term of patent years
Int. Cl. D14—*03*
U.S. Cl. D14—68



260,772
ADAPTOR FOR AN AGRICULTURAL TINE
William M. Johnson, Melton South, and Allan Lindsay, Hoppers Crossing, both of Australia, assignors to Ralph McKay Limited, Victoria, Australia
Filed Apr. 19, 1979, Ser. No. 31,488
Claims priority, application Australia, Oct. 19, 1978, 76.255
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29



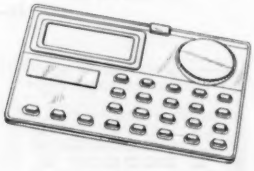
260,773
PHOTOGRAPHIC ENLARGING APPARATUS
Wilhelm Pramstraller, Brixen, Italy, assignor to Durst A.G. Fabrik Fototechnischer Apparate, Bozen, Italy
Filed Jan. 29, 1979, Ser. No. 7,242
Claims priority, application Italy, Aug. 29, 1978, 6716/78[U]
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—25



260,774
PAIR OF COMBINED RIGID TEMPLES AND FLEXIBLE INTEGRATED EAR CLIPS FOR HEARING AID SPECTACLES
Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205
Filed Mar. 16, 1977, Ser. No. 778,801
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—127

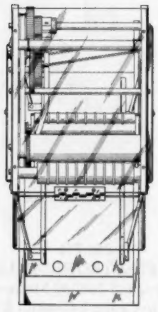
260,775
GUITAR
John P. Gaudio, 75 Ambrose St., Rochester, N.Y. 14608
Filed May 11, 1979, Ser. No. 38,237
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—18

260,776
DESK TOP ELECTRONIC CALCULATOR
Eiichi Yoshioka, Tokyo, and Junichi Motoyoshi, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 4, 1979, Ser. No. 27,081
Claims priority, application Japan, Oct. 4, 1978, 53-42376
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

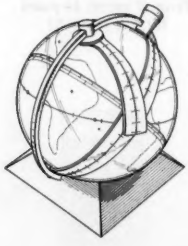


260,777
COMBINED ELECTRONIC CALCULATOR AND CLOCK
Eiichi Yoshioka, Tokyo, and Tsutomu Okuyama, Kawaguchi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 8, 1979, Ser. No. 64,848
Claims priority, application Japan, Feb. 28, 1979, 54-7665
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

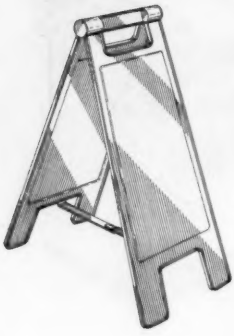
260,778
FAN FOLDING APPARATUS
Richard L. Edwards, Windsor Locks, and Martin Kesten, West Hartford, both of Conn., assignors to Preston Engravers, Inc., Windsor, Conn.
Filed Apr. 18, 1979, Ser. No. 31,126
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—22



260,779
COMBINATION CELESTIAL AND TERRESTRIAL GLOBE
Daniel L. Wenger, P.O. Box 221, Soquel, Calif. 95073
Filed Jan. 11, 1979, Ser. No. 2,656
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—61

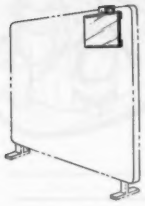


260,780
SELF-STANDING FLOOR SIGN
Dale T. Maza, Stephenson; Glen E. Tomblin, Winchester, and Harold Ruckman, Stephenson, all of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Oct. 18, 1979, Ser. No. 85,858
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10

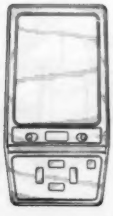


260,781
CEMETERY STONE MARKER
Marguerite E. Lusher, 182 Hemet Dr., Citrus Heights, Calif. 95610
Filed May 18, 1978, Ser. No. 907,253
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—22

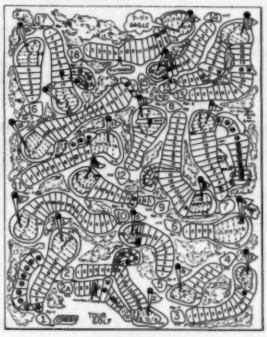
260,782
WALL OR PARTITION HUNG GRAPHICS HOLDER
Donald A. DeMars, Canoga Park, Calif., assignor to LeRoy M. Lefkowitz, Van Nuys, Calif., a part interest
Filed Nov. 30, 1978, Ser. No. 965,441
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—42



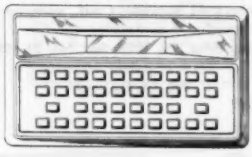
260,783
HAND-HELD ELECTRONIC GAME CASING
Kenji Shimasaki, Hong Kong, Hong Kong, assignor to Cassia Electronic Products Limited, Aberdeen, Hong Kong
Filed Jan. 12, 1979, Ser. No. 2,889
Claims priority, application United Kingdom, Nov. 29, 1978, 987462/78
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



260,784
GAMEBOARD
William W. Lavigno, II, 3742 Majorca Ct. Apt. 101, Clarkston, Ga. 30021, and Hardy Johnson, 9517 Whitethorn Dr., Matthews, N.C. 28105
Filed Aug. 21, 1979, Ser. No. 68,489
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—27



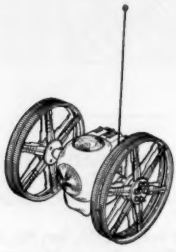
260,785
ELECTRONIC WORD GAME CASING OR SIMILAR ARTICLE
Edward Mayer, Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 5, 1979, Ser. No. 1,511
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13



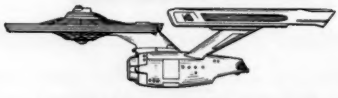
260,786
ILLUMINATION DEVICE FOR ATTACHMENT TO TOY FLYING SAUCER
Stanley C. Chaklos, 420 Kelso Dr., Erie, Pa. 16505
Filed Apr. 25, 1979, Ser. No. 33,247
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—82

260,787
SIMULATIVE KITE
Yasuo Tanaka, 420 Oaza Murata, Washima-gun, Santo-gun, Niigata-ken, Japan
Filed Jan. 31, 1979, Ser. No. 8,332
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—83

260,788
TOY SPACECRAFT
Shigeru Saitoh, No. 6-4, 2-Chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Mar. 7, 1979, Ser. No. 18,354
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87

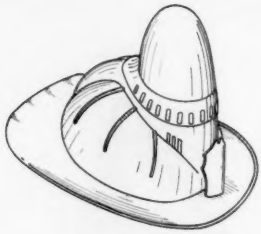


260,789
TOY SPACESHIP
Andrew G. Probert, El Segundo, Calif., assignor to Paramount Pictures Corporation, Los Angeles, Calif.
Filed Mar. 19, 1979, Ser. No. 21,475
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87

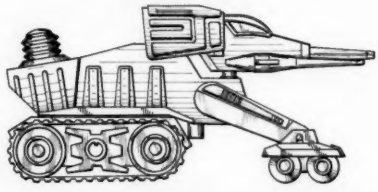


260,790
JOINT ELEMENT AND STRUT ASSEMBLY
Richard J. Gabriel, Portland, Oreg., assignor to Matrix Toys, Inc., Portland, Oreg.
Filed Mar. 12, 1979, Ser. No. 19,741
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—108

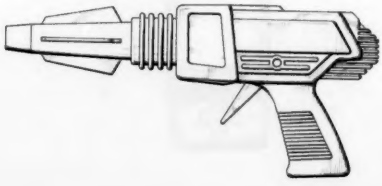
260,791
TOY HELMET
Kataro Suda, Tokyo, Japan, assignor to Yonezawa Toys Co. Ltd. and Suda Kinzoku Seisakusho Co. Ltd., both of Tokyo, Japan
Filed May 18, 1977, Ser. No. 798,038
Claims priority, application Japan, Mar. 17, 1977, 52-9763
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—109



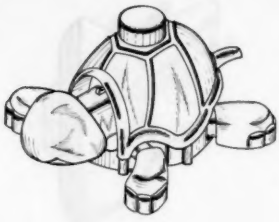
260,792
TOY VEHICLE
Lawrence T. Jones, Playa Del Rey; Anson Sims, Granada Hills, and Robert S. Lee, West Lake Village, all of Calif., assignors to California R & D Center, Culver City, Calif.
Filed Feb. 9, 1979, Ser. No. 10,828
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—131



260,793
TOY PISTOL
Jerry M. McAlpin, P.O. Box 7, Bullard, Tex. 75757, and Danny R. Waites, Rte. 1, Box 344 D2, Jacksonville, Tex. 75766
Filed Apr. 10, 1979, Ser. No. 28,830
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—147

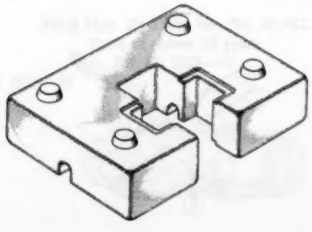


260,794
TOY TURTLE FIGURE
Toshinori Tabata, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sep. 10, 1979, Ser. No. 74,164
Claims priority, application Japan, Mar. 16, 1979, 54-10368
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

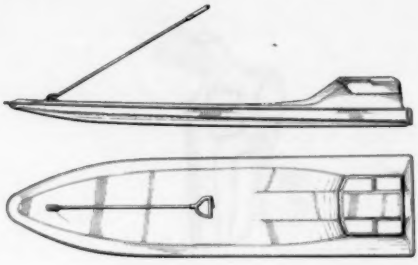


260,795
TOY MONKEY FIGURINE
Hiroshi Ohkawa, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sep. 27, 1979, Ser. No. 80,121
Claims priority, application Japan, Mar. 30, 1979, 54-12723
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150

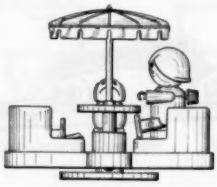
260,796
APERTURED CASTING
Tim M. Uyeda, South San Gabriel, Calif., assignor to Marcy Gymnasium Equipment Co., Alhambra, Calif.
Filed Aug. 13, 1979, Ser. No. 65,909
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—196



260,797
POWER OPERATED SURFBOARD
Gerald R. Calengor, Duluth, and Allan J. Fehn, Fridley, both of Minn., assignors to Surf-Jet Corporation, St. Paul, Minn.
Filed Feb. 21, 1979, Ser. No. 13,263
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—228



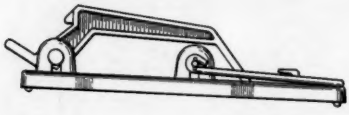
260,798
COMBINED TOY MERRY-GO-ROUND AND FIGURES THEREFOR
Naoharu Yamashina, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai Overseas, Tokyo, Japan
Filed Feb. 5, 1979, Ser. No. 9,058
Claims priority, application Japan, Aug. 10, 1978, 53-33920
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—249



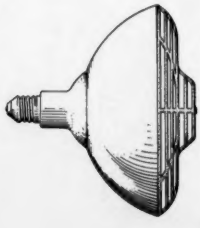
260,799
GUN GRIP
John E. Bianchi, 100 Calle Cortez, Temecula, Calif. 92390
Filed Feb. 8, 1980, Ser. No. 119,757
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—1

260,800
CROSS DRAW HOLSTER
John E. Bianchi, 1601 Wilt Rd., and Richard D. E. Nichols, 813 Cozy Ct., both of Fallbrook, Calif. 92390
Filed Dec. 14, 1979, Ser. No. 102,995
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D22—13

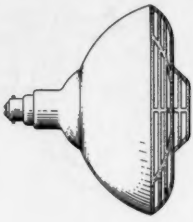
260,801
ANIMAL TRAP
John F. Adams, 65 Lanark Rd., Apt. 9, Brighton, Mass. 02135
Filed Dec. 3, 1979, Ser. No. 99,318
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



260,802
ULTRASONIC PEST REPELLING DEVICE
Lester B. Hall, Kenmore, N.Y., assignor to Gary Lester Hall, Kenmore, N.Y.
Filed Dec. 31, 1979, Ser. No. 108,714
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18

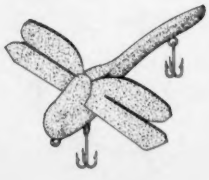


260,803
ULTRASONIC PEST REPELLING DEVICE
Lester B. Hall, Kenmore, N.Y., assignor to Gary Lester Hall, Kenmore, N.Y.
Continuation-in-part of Ser. No. 108,714, Dec. 31, 1979. This application Apr. 17, 1980, Ser. No. 137,055
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18

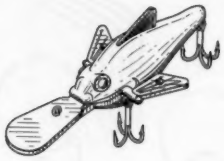


260,804
FISHING REEL
Masakazu Sakamoto, and Tetsuyuki Doi, both of Fukuyama, Japan, assignors to Ryobi Ltd., Fuchu, Japan
Filed Oct. 24, 1979, Ser. No. 88,213
Claims priority, application Japan, Apr. 25, 1979, 54-17206
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

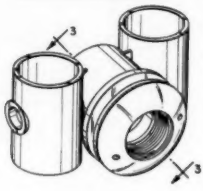
260,805
ARTIFICIAL FISH LURE
Eugene A. Gregg, 13851 Monoclair La., Woodbridge, Va. 22193
Filed Oct. 11, 1979, Ser. No. 83,984
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



260,806
FISHING LURE
Robert L. Finlay, Emporia, Kans., assignor to Thomas J. Notestine, Grandview and James R. Cope, Kansas City, both of, Mo.
Filed Oct. 22, 1979, Ser. No. 86,762
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



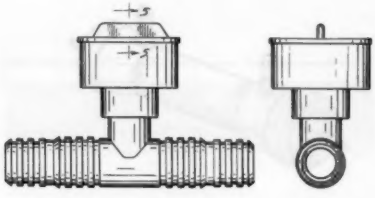
260,807
HYDRO-THERAPY NOZZLE FOR HYDRO-THERAPY SPAS
Gerald W. Moreland, 11651 Pickett La., Garden Grove, Calif. 92640
Filed Nov. 5, 1979, Ser. No. 91,064
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34



260,808
LIQUID DISPENSER FOR SHOWERS OR THE LIKE
James J. Headen, 1602 216th Ave., SE., Issaquah, Wash. 98027; Warren D. Abbott, Jr., 9964 Tanglevine, Dallas, Tex. 75238, and Clifton G. Hampton, Euless, Tex., assignors to James J. Headen, Issaquah, Wash. and Warren D. Abbott, Jr., Dallas, Tex.
Filed Mar. 29, 1979, Ser. No. 24,882
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

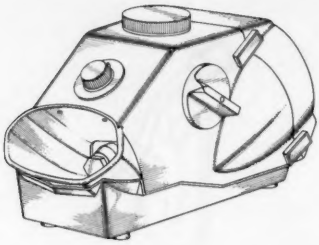
260,809
SHOWER OUTLET FITTING
Gary A. Fleischmann, Sheboygan, Wis., and Lawrence C. Peabody, Rindge, N.H., assignors to Kohler Co., Kohler, Wis.
Filed Apr. 10, 1980, Ser. No. 138,838
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

260,810
AUTOMOTIVE HOSE FITTING
Marvin G. Cleveland, 1077 Jessie St., St. Paul, Minn. 55101
Filed Jan. 22, 1979, Ser. No. 5,132
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—44

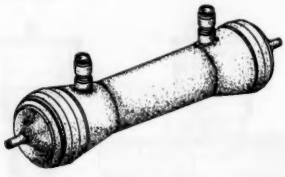


260,811
DENTAL IMPRESSION TRAY
Joseph P. Kitchenman, Cornwells Heights, Pa., assignor to Modern Materials, Inc., Columbus, Ohio
Filed Nov. 8, 1978, Ser. No. 958,753
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—10

260,812
AMALGAMATOR
Meyer Piet, Arcadia, and Dean G. Giles, Valinda, both of Calif., assignors to Futurecraft Corporation, City of Industry, Calif.
Filed Jan. 22, 1979, Ser. No. 5,370
Term of patent 14 years
Int. Cl. D24—*02;* D15—*09*
U.S. Cl. D24—10

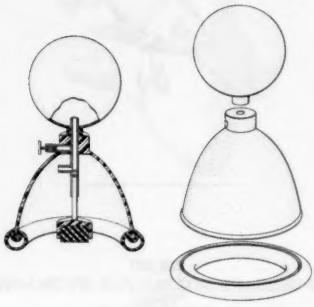


260,813
HOLLOW FIBER ARTIFICIAL KIDNEY
Zane H. Geel, Concord, Calif., assignor to Cordis Dow Corp., Miami, Fla.
Filed May 14, 1979, Ser. No. 39,043
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—21



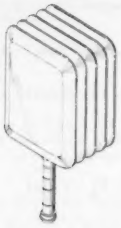
260,814
SYRINGE HAVING A CALIBRATED PLUNGER
Donald J. Goldhardt, Grove City, Ohio, and Darcy M. Willis, Gurnee, Ill., assignors to Abbott Laboratories, North Chicago, Ill.
Filed Oct. 30, 1978, Ser. No. 955,994
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—24

260,815
SUCTION ELECTRODE
Peter J. Staver, Lincoln Park, Mich., assignor to Bernard B. Staver and Margaret Staver, both of Baraboo, Wis., part interest to each
Filed Oct. 16, 1978, Ser. No. 951,845
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D24—29



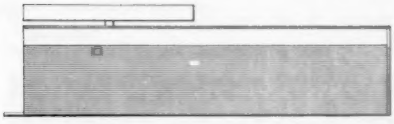
260,816
INTRAVENOUS EQUIPMENT SUPPORT OR SIMILAR ARTICLE
Nicholas Zissimopoulos, Schaumburg, and Lenart Anderson, Mt. Prospect, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jan. 8, 1979, Ser. No. 1,640
Term of patent 7 years
Int. Cl. D24—*99*
U.S. Cl. D24—31

260,817
DISPENSING BAG FOR FLUIDIC USES
William C. Christine, 341 St. John St., Catasauque, Pa. 18032
Filed Jul. 26, 1979, Ser. No. 60,855
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—58



260,818
PROPHYLACTIC DEVICE
Tadao Okamoto, 12-8, 1-chome, Kohinata, Bunkyo-ku, Tokyo, Japan
Filed May 17, 1979, Ser. No. 39,817
Term of patent 14 years
Int. Cl. D24—*04, 99*
U.S. Cl. D24—99

260,819
COMBINED SERVICE STATION BUILDING AND CANOPY
Charles M. Baffo, Wilton, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Mar. 30, 1979, Ser. No. 25,316
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33



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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Adolfsson, Morgan; and Brogardh, Torgny, to ASEA Aktiebolag. Measuring device for transmitting measuring signals via an optical link. 4,290,146, Cl. 455-612.000.

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Lermann, Peter; Wagner, Karl; Schultes, Herbert; and Fauth, Gunter, 4,289,390, Cl. 354-187.000.

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Lee, Ping I., 4,289,815, Cl. 428-35.000.

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Takada, Shigetaka; Nomura, Masaaki; and Itoh, Manabu, 4,289,104, Cl. 123-471.000.

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Andersson, Olof I.; and Kullander, Jan O., 4,289,363, Cl. 312-257.00R.

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Alderton, Gordon H. S., to Henry Lindsay Limited. Hook bolt adapter. 4,289,059, Cl. 411-531.000.

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Stern, Donald J., 4,288,928, Cl. 36-2.600.

Alpaugh, Warren A.; Macur, George J.; and Sharkness, James E., to International Business Machines Corporation. Treatment of waste compositions. 4,289,594, Cl. 204-158.00R.

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Sawamura, Mitsuyoshi, 4,289,053, Cl. 83-62.100.

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Knott, Jack E., II, 4,289,830, Cl. 428-475.800.
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Maroszek, Raymond V., 4,289,266, Cl. 229-28.0BC.
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Goodman, Richard M.; and Lim, Sim K., 4,289,613, Cl. 209-167.000.
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Harshberger, Robert P., Jr., 4,289,999, Cl. 318-341.000.

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Hellouin de Menibus, Olivier, 4,289,018, Cl. 73-19.000.

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Greve, Wilfried; von Schuh, Heinzgeorg; and Anagnostopulos, Hiristo, 4,289,765, Cl. 424-246.000.

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Andree, Hans: *See*—
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Andrew, Wesley A.: *See*—
Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., 4,290,020, Cl. 324-334.000.
Andrews, Claude R., to J. M. Huber Corporation. Removal of contaminants from strongly alkaline solution. 4,289,629, Cl. 210-737.000.
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Bailey, Alfred J., to Massey-Ferguson Services N.V. Tramlining device for seed drill. 4,289,256, Cl. 222-52.000.
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Herdle, William B.; Kanner, Bernard; and Bailey, Donald L., 4,289,889, Cl. 556-470.000.
Bailey, George W., to Exxon Research & Engineering Co. Magnetic catalysts and their preparation. 4,289,655, Cl. 252-466.00B.
Bailey, James E.; and Cho, Yong K., to Illinois Water Treatment Company. High loading of immobilized enzymes on activated carbon supports. 4,289,853, Cl. 435-177.000.
Bajeux, Etienne, to FMC Corporation. Pipe swivel joint for a plurality of separate fluids. 4,289,336, Cl. 285-136.000.
Baker, Cole H., to Intec Corporation. Radiation inspection system for a material making apparatus and method using a beta ray gauge. 4,289,964, Cl. 250-308.000.
Baker, Donald G., to Micro-Tek, Inc. Security identification system using pulse code modulation. 4,289,931, Cl. 179-5.500.
Baker International Corporation: *See*—
Fisher, Hiram H., Jr., 4,289,200, Cl. 166-120.000.
Baker, Thomas R.: *See*—
Collura, Peter C.; and Baker, Thomas R., 4,289,491, Cl. 493-124.000.
Bakken, Jon A.: *See*—
Raaness, Ola S.; and Bakken, Jon A., 4,289,949, Cl. 219-121.0PR.
Baldini, Alberto: *See*—
Leoni, Roberto; Baldini, Alberto; and Angelini, Gianfranco, 4,289,723, Cl. 264-187.000.

Balko, Terry W.; and Hackler, Ronald E., to Eli Lilly and Company. Heterocyclic carbothioamides. 4,289,766, Cl. 424-246.000.

Balko, Terry W., to Eli Lilly and Company. 2-(Substituted imino)-N-(3-substituted phenyl)-3-thiazolidinecarbothioamides. 4,289,778, Cl. 424-263.000.

Ball Corporation: *See*—
Scholes, Addison B., 4,289,504, Cl. 55-11.000.

Banholzer, Detlef, to Volkswagenwerk AG. Heat-expandable multi-passage pipe having parts for intended breakage. 4,289,169, Cl. 138-117.000.

Bankstahl, Herbert A.: *See*—
Weronke, Robert B.; and Bankstahl, Herbert A., 4,289,488, Cl. 440-57.000.

Bare, Gary T.; and Zimmerman, Lee T., to International Business Machines Corporation. Wire fire mapping for printers. 4,290,138, Cl. 371-29.000.

Barker, Lynn M., to Terra Tek, Inc. Gauge for measuring the mouth opening displacement of fracture toughness test specimens. 4,289,036, Cl. 73-799.000.

Barker, Michael D., to Shell Oil Company. Herbicidal tetrahydrofuran derivatives. 4,289,884, Cl. 546-283.000.

Barnes, Robin R.; Delves, Ronald F.; and Slasor, James F., to Frazer Nash Limited. Actuators. 4,289,996, Cl. 318-38.000.

Barrow, Kevin D.; and Mellows, Graham, to Beecham Group Limited. Antibiotics. 4,289,703, Cl. 260-345.80R.

Barth, Inc.: *See*—
Barth, James T., 4,289,271, Cl. 236-1.00G.

Barth, James T., to Barth, Inc. Damper construction for a gas fired combustion apparatus. 4,289,271, Cl. 236-1.00G.

Bartholic, David B., to Engelhard Minerals & Chemicals Corporation. Catalytic cracking of metal contaminated mineral oil fractions. 4,289,605, Cl. 208-113.000.

Bartl, Max: *See*—
Strehler, Richard; and Bartl, Max, 4,289,223, Cl. 192-48.910.

Basaglia, Rubens: *See*—
Bollina, Ezio; and Basaglia, Rubens, 4,289,276, Cl. 239-305.000.

Basche, Joyce O., heir: *See*—
Galasso, Francis S.; and Basche, Malcolm, deceased, 4,289,801, Cl. 427-94.000.

Basche, Malcolm, deceased: *See*—
Galasso, Francis S.; and Basche, Malcolm, deceased, 4,289,801, Cl. 427-94.000.

BASF Aktiengesellschaft: *See*—
Czauderna, Bernhard; Einwiller, Andreas; and Bott, Kaspar, 4,289,676, Cl. 260-29.60H.
Koehler, Waldemar; Blumenberg, Bernd; Vogel, Ludwig; and Hetzel, Eckhard, 4,289,589, Cl. 203-49.000.

BASF Wyandotte Corporation: *See*—
Patil, Arvind S., 4,289,745, Cl. 423-594.000.
Stepp, James D., 4,289,698, Cl. 260-314.500.

Basham, Edward R.; and Mosely, L. Max, to Gearhart Industries, Inc. Well casing free-point indicator. 4,289,024, Cl. 73-151.000.

Bates, Roger D.; and Knight, Gordon R., to Xerox Corporation. Self-synchronizing clock source for optical memories. 4,290,122, Cl. 365-234.000.

Battigelli, Jean A.; and Bouquet, Francois, to Saint-Gobain Industries. Glass fiberization by centrifugal feed of glass into attenuating blast. 4,289,518, Cl. 65-15.000.

Bauer, John R.; Byars, Robert W.; and Grieve, Robin L., to Upjohn Company, The. Apparatus for intimately admixing two chemically reactive liquid components. 4,289,732, Cl. 422-224.000.

Bauer Kaba AG Sicherheits-Schliessyteme: *See*—
Gretler, Heinrich, 4,289,002, Cl. 70-358.000.

Bauernfeind, Karl: *See*—
Blaess, Gerhard; and Bauernfeind, Karl, 4,290,010, Cl. 324-57.0SS.

Baughman, D. Joseph; and Lytwyn, Ann, to Ortho Diagnostics, Inc. One-stage prothrombin assay and compositions useful therein. 4,289,498, Cl. 23-230.00B.

Baumann, Jacob S.; and Geluk, Ronald J., to N.V. Optische Industrie "De Oude Delft". Method and apparatus for electro-optically convoluting a one-dimensional signal. 4,290,112, Cl. 364-822.000.

Baxter Travenol Laboratories, Inc.: *See*—
Roe, Frank L., 4,289,337, Cl. 285-158.000.

Bayer Aktiengesellschaft: *See*—
Bahrmann, Helmut; Weber, Jurgen; and Cornils, Boy, 4,289,913, Cl. 568-444.000.
Blomeyer, Freidrich, deceased; Mennicken, Gerhard; and Uerdingen, Walter, 4,289,813, Cl. 427-385.500.
Druschke, Frank; Margotte, Dieter; Tresper, Erhard; Bottenbruch, Ludwig; Cohnen, Wolfgang; and Hucks, Uwe, 4,289,685, Cl. 260-45.70S.
Friederich, Klaus; Heinze, Gerhard; Reiff, Helmut; Michael, Dietrich; Schon, Manfred; Markusch, Peter; Haberland, Ulrich; Dieterich, Dieter; and Merten, Josef, 4,289,672, Cl. 260-29.2TN.
Herold, Heiko; Herold, Richard; Klee, Rudolf J.; and Muschelknautz, Edgar, 4,288,893, Cl. 28-266.000.
Imre, Laszlo; Horstmann, Walter; and Leopold, Hans-Gerhard, 4,289,881, Cl. 544-352.000.
Lewalter, Jurgen; Merten, Rudolf; Zecher, Wilfried; and Dunwald, Willi, 4,289,868, Cl. 528-73.000.
Mitschke, Karl-Heinz; and Niederprum, Hans, 4,289,646, Cl. 252-305.000.
Noll, Klaus; Speicher, Wolfgang; Pedain, Josef; and Schmid, Rosemarie, 4,289,827, Cl. 428-423.400.
Sasse, Klaus; Haller, Ingo; Plempel, Manfred; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,289,771, Cl. 424-249.000.
Wehling, Bernhard, 4,289,887, Cl. 548-224.000.

Baynard, Shirley. Simulated tree furniture and method of molding same. 4,289,724, Cl. 264-225.000.

Baz, Amr M. S.: *See*—
Seireg, Ali A.; and Baz, Amr M. S., 4,289,126, Cl. 128-204.240.

Beaumont, Gregory J.; and Matthews, Lloyd E., to Zenith Radio Corporation. Vertical drive circuit for video display. 4,289,994, Cl. 315-371.000.

Becker, Eckhart R.; Daughenbaugh, Randall J.; and Milligan, Barton, to Air Products and Chemicals, Inc. Production of higher amines by the gas phase hydrogenation of nitriles. 4,289,908, Cl. 564-490.000.

Beckmann, Franz: *See*—
Weber, Heinrich; Dungs, Horst; Wollenhaupt, Karl-Heinz; Brasseur, Yves; Birscheidt, Henri; and Beckmann, Franz, 4,289,500, Cl. 44-15.00R.

Becton, Dickinson and Company: *See*—
Lynn, Robert W., 4,289,248, Cl. 215-330.000.

Beecham Group Limited: *See*—
Barrow, Kevin D.; and Mellows, Graham, 4,289,703, Cl. 260-345.80R.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,289,779, Cl. 424-263.000.
Robinson, Jeffery H., 4,289,850, Cl. 435-68.000.
Smale, Terence C., 4,289,696, Cl. 260-245.20T.

Beecroft, Harold J., to Texas Instruments Incorporated. System and method for erasing information from a flexible information storage media. 4,290,088, Cl. 360-66.000.

Behnke, Jurgen: *See*—
Warncke, Ernst; Schlobohm, Joachim; and Behnke, Jurgen, 4,289,238, Cl. 206-527.000.

Belco Pollution Control Corporation: *See*—
Lanese, Philip M., 4,290,003, Cl. 323-241.000.

Belfort, Gerard L. A., to Produits Chimiques Ugine Kuhlmann. Process for the industrial preparation of water insoluble azo dyestuffs containing cyano groups from the corresponding halogen compounds. 4,289,694, Cl. 260-208.000.

Belkind, Benjamin A., to Velsicol Chemical Coporation. Herbicidal 3-(tetrahydrobenzothiazol-2-yl)tetrahydro-1,3,5-oxadiazin-4-ones. 4,289,524, Cl. 71-90.000.

Bell & Howell Company: *See*—
Aten, Dwight W., 4,288,966, Cl. 53-469.000.
Jastrab, Alexander G., 4,289,396, Cl. 355-45.000.
Samek, Norbert E., 4,289,384, Cl. 350-392.000.

Bell, Printes G , to Bell-Terry Automotive Electric, Inc. Commutator puller. 4,288,915, Cl. 29-762.000.

Bell Telephone Laboratories: *See*—
Eichenbaum, Bernard R.; and Topolski, Francis J., 4,289,558, Cl. 156-179.000.

Bell Telephone Laboratories, Inc.: *See*—
Bowden, Murrae J. S.; and Thompson, Larry F., 4,289,845, Cl. 430-296.000.
Fraser, Donald L., Jr.; and Vera, Armando J., 4,290,034, Cl. 333-173.000.
Henry, James L., 4,289,933, Cl. 179-18.0FA.

Bell-Terry Automotive Electric, Inc.: *See*—
Bell, Printes G., 4,288,915, Cl. 29-762.000.

Bellot, Dominique; and Cohenca, Alain, to Regie National des Usines Renault. Climate control device for the passenger compartment of motor vehicle. 4,289,195, Cl. 165-12.000.

Bemm, Wulf W.; and Weber, Gunter, to Neiman S.A. Motor vehicle door lock. 4,289,342, Cl. 292-49.000.

Bendix Corporation, The: *See*—
Eppley, Dewey W., 4,290,060, Cl. 340-638.000.
Killinger, Marvin H., 4,290,045, Cl. 340-52.00C.
Lee, Chen Y., 4,289,035, Cl. 73-708.000.
Schildkraut, Alan L., 4,289,368, Cl. 339-89.00M.

Bengtsson, Karl S.; Thorberg, Seth O.; and Ogren, Sven O., to Astra Lakemedel Aktiebolag. Anti-psychotic phthalimidine derivatives. 4,289,781, Cl. 424-267.000.

Benjamin, Martin E.: *See*—
Cather, Douglas A., Jr.; and Benjamin, Martin E., 4,289,318, Cl. 277-12.000.

Benton, Kenneth C.; Mooney, James R.; and Weinert, Raymond J., Jr., to Standard Oil Company, The. Supported catalysts for the polymerization of alpha-olefins. 4,289,651, Cl. 252-429.00B.

Beretta, Pier C., to Fabbrica d'Armi Pietro Beretta S.p.A. Adjustable legs support for automatic weapons. 4,288,939, Cl. 42-94.000.

Berg, Robert H.; and Karuhn, Richard F., to Particle Data, Inc. Particle length and volume comeasurement with controlled orientation. 4,290,011, Cl. 324-71.0CP.

Bergman, Clark: *See*—
Strom, Richard A.; Bergman, Clark; and Michalek, Paul F., 4,289,364, Cl. 339-17.0CF.

Bergwerksverband GmbH: *See*—
Kolling, Georg; Pietzka, Gerhard; Romey, Ingo; and Tillmanns, Harald, 4,289,604, Cl. 208-106.000.

Berisch, Volker: *See*—
Lupertz, Hans-Henning; and Berisch, Volker, 4,289,359, Cl. 303-6.00C.

Berkshire, David C.: *See*—
Richardson, Edwin A.; Scheuerman, Ronald F.; and Berkshire, David C., 4,289,633, Cl. 252-8.55B.

Berlino, Gary M. Word forming checkers game method. 4,289,314, Cl. 273-260.000.

Bernstein, Robert I., to Electro-Catheter Corporation. Tripolar catheter apparatus. 4,289,134, Cl. 128-419.0PG.

Berry, Robert L.: *See*—
Radigan, Steven J.; and Berry, Robert L., 4,289,574, Cl. 156-643.000.
Berstein, Garrj, to Wilhelm Hegenscheidt GmbH. Boring tool with floating blades. 4,289,431, Cl. 408-154.000.
Berte, Marc; and Legrand, Pierre, to Thomson-CSF. Device for quantitative display of the current density within a charged-particle beam. 4,290,012, Cl. 324-71.0EB.
Bertolini, Natale; and Ferlazzo, Natale, to Euteco Impianti S.p.A. Supported catalyst for the oxidation of acrolein into acrylic acid. 4,289,654, Cl. 252-456.000.
Bethlehem Steel Corporation: *See*—
Chuss, David M.; and Scheirer, James W., 4,289,584, Cl. 201-39.000.
Betts Machine Company: *See*—
Pierson, Karl B., 4,290,098, Cl. 362-267.000.
Betz Laboratories, Inc.: *See*—
Muccitelli, John A., 4,289,645, Cl. 252-178.000.
Bexford Limited: *See*—
Boutle, David L.; Rennison, Stuart C.; and Lambert, Stuart G., 4,289,843, Cl. 430-271.000.
Beyer, George J.: *See*—
King, Peter F.; and Beyer, George J., 4,289,547, Cl. 148-6.15R.
Bhat, Waman V.; and Wright, Charles P., to Boeing Company, The. Noise suppressing turbofan nozzles and method. 4,288,984, Cl. 60-262.000.
Biax Fiberfilm Corp.: *See*—
Schwarz, Eckhard C. A., 4,289,832, Cl. 428-542.000.
Bicskei, Bela J. Precision blocking of lens blanks. 4,288,946, Cl. 51-284.00E.
Binkley Company, The: *See*—
Meehan, M. Dennis, 4,288,957, Cl. 52-460.000.
Bird-Johnson Company: *See*—
Esthimer, William F., 4,289,222, Cl. 192-0.033.
Birr, Hans J.; and Uibel, Paul-Ulrich, to Vorwerk & Co. Interholding GmbH. Arrangement for mounting and dismounting pivoted levers in tool housings. 4,289,416, Cl. 403-146.000.
Birscheidt, Henri: *See*—
Weber, Heinrich; Dungs, Horst; Wollenhaupt, Karl-Heinz; Brasseur, Yves; Birscheidt, Henri; and Beckmann, Franz, 4,289,500, Cl. 44-15.00R.
Bixby, James A.; and Lentz, Robert A., to Spin Physics, Inc. Coarse and fine control of segmented video playback apparatus with ancillary recording medium. 4,290,087, Cl. 360-33.000.
Blaess, Gerhard; and Bauernfeind, Karl, to Siemens Aktiengesellschaft. Method and apparatus for measuring transmission characteristic of a test object. 4,290,010, Cl. 324-57.0SS.
Blase, Manfred: *See*—
Wagener, Dietrich; Flockenhaus, Claus; and Blase, Manfred, 4,289,585, Cl. 202-227.000.
Blasius, James R., to HJH Chemicals, Inc. Method of making crude boric acid from borate and sulfuric acid. 4,289,662, Cl. 252-607.000.
Blessing, Hubert, to Levi Strauss & Co. Fused belt loop strips. 4,289,820, Cl. 428-125.000.
Block, Werner; Pilsak, Manfred; Dusedau, Klaus; and Greiler, Wolfgang, to Robert Bosch GmbH. High-pressure discharge lamp and reflector combination. 4,290,097, Cl. 362-264.000.
Blomeyer, Agnes, heiress: *See*—
Blomeyer, Freidrich, deceased; Mennicken, Gerhard; and Uerdingen, Walter, 4,289,813, Cl. 427-385.500.
Blomeyer, Freidrich, deceased (by Blomeyer, Agnes, heiress); Mennicken, Gerhard; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Process for coating solvent-free lacquers. 4,289,813, Cl. 427-385.500.
Blomquist, Alfred P.: *See*—
Mikel, Steve A.; and Blomquist, Alfred P., 4,289,048, Cl. 74-733.000.
Blumenberg, Bernd: *See*—
Koehler, Waldemar; Blumenberg, Bernd; Vogel, Ludwig; and Hetzel, Eckhard, 4,289,589, Cl. 203-49.000.
Bochis, Richard J.; Fisher, Michael H.; and Linn, Bruce O., to Merck & Co., Inc. Pyromellitic diimides and method of increasing feed efficiency in ruminant animals. 4,289,784, Cl. 424-274.000.
Bock, Karin: *See*—
Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann J., 4,289,756, Cl. 424-101.000.
Bockrath, Ronald E., to Standard Oil Company (Indiana). Aqueous crystallization of polyester. 4,289,874, Cl. 528-487.000.
Boden, Ogden W. Cord lock having depressable plunger. 4,288,891, Cl. 24-115.00G.
Boeing Company, The: *See*—
Bhat, Waman V.; and Wright, Charles P., 4,288,984, Cl. 60-262.000.
Gransberry, N. Keith; and Haggerty, Allen C., 4,289,288, Cl. 248-56.000.
Bogentoft, Conny B.; and Appelgren, Curt H., to Aktiebolaget Hassle. Method for preparing preparations having controlled release of an active component. 4,289,795, Cl. 427-3.000.
Bogner, Richard D. Microwave television system. 4,290,068, Cl. 343-702.000.
Boiko, Georgy A.: *See*—
Dubinsky, Rudolf S.; Medovar, Boris I.; and Boiko, Georgy A., 4,289,192, Cl. 164-470.000.
Boirin, Jean-Claude A. E.; and Guenon, Jean-Pierre, to Sperry Corporation. Automatic bale wagon. 4,289,435, Cl. 414-39.000.
Boise Cascade Corporation: *See*—
Ellerbrock, Donald H., 4,289,265, Cl. 229-5.500.
Bolldorf, Kurt; and Bruckner, Ernst, to Pfaff Industriemaschinen GmbH. Needle bar coupling in an embroidering machine. 4,289,086, Cl. 112-221.000.
Bollina, Ezio; and Basaglia, Rubens, to B & B Bologna di Basaglia Rubens e Bollina Ezio S N C. Improved apparatus for cleaning vehicles. 4,289,276, Cl. 239-305.000.
Bolton, Nelson P., to Advanced Glass Systems Corporation. Method and apparatus for bending glass sheets. 4,289,520, Cl. 65-104.000.
Bolza-Schunemann, Hans B., to Koenig & Bauer Aktiengesellschaft. Brake for sheet stacks on a folding table. 4,289,494, Cl. 493-405.000.
Bonanno, Anthony J.: *See*—
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 4,289,578, Cl. 159-47.0WL.
Boone, Gary W.; and Cochran, Michael J., to Texas Instruments Incorporated. Variable function programmed calculator. 4,290,121, Cl. 365-233.000.
Booth, Barclay, to Paper, Inc. Method and apparatus for splicing folded paper. 4,289,556, Cl. 156-157.000.
Borg-Warner Corporation: *See*—
Seaman, Robert L., 4,289,213, Cl. 180-233.000.
Bornell, Donald G. Removeable taps. 4,288,930, Cl. 36-132.000.
Bortz, Wayne E., to Soft Bathtub Company, The. Method of making a cushioned bathroom article. 4,289,717, Cl. 264-46.500.
Bosch Siemens Hausgerate GmbH: *See*—
Feil, Rolf, 4,289,566, Cl. 156-515.000.
Both, Marinus: *See*—
Trunner, Josef; and Both, Marinus, 4,289,039, Cl. 74-2.000.
Bott, Kaspar: *See*—
Czauderna, Bernhard; Einwiller, Andreas; and Bott, Kaspar, 4,289,676, Cl. 260-29.60H.
Bottcher, Irmgard: *See*—
Albrecht, Rudolf; Schroder, Eberhard; and Bottcher, Irmgard, 4,289,777, Cl. 424-258.000.
Bottenbruch, Ludwig: *See*—
Druschke, Frank; Margotte, Dieter; Tresper, Erhard; Bottenbruch, Ludwig; Cohnen, Wolfgang; and Hucks, Uwe, 4,289,685, Cl. 260-45.70S.
Bouquet, Francois: *See*—
Battigelli, Jean A.; and Bouquet, Francois, 4,289,518, Cl. 65-15.000.
Bourgeois, Norman J. Collapsible protective cover mechanism. 4,289,346, Cl. 296-105.000.
Bout, Bernardus J.: *See*—
Theron, Jacob J.; Bout, Bernardus J.; Van Wyk, Jacobus P.; and De Lange, Michael D., 4,290,021, Cl. 324-429.000.
Boutle, David L.; Rennison, Stuart C.; and Lambert, Stuart G., to Bexford Limited. Photopolymerizable element having initiator in adhesive layer. 4,289,843, Cl. 430-271.000.
Bowden, Murrae J. S.; and Thompson, Larry F., to Bell Telephone Laboratories, Inc. Fabrication based on radiation sensitive resists and related products. 4,289,845, Cl. 430-296.000.
Brand, Werner; Zavadil, Jaroslav; and Heuer, Wolfgang, to Waggonfabrik Uerdingen AG. Arrangement for arresting and releasing an intermediate buffer coupling. 4,289,247, Cl. 213-20.000.
Brand, Wilhelm, to Hermann Berstorff Maschinenbau GmbH. Apparatus for plasticizing and extruding plastic material. 4,289,409, Cl. 366-83.000.
Brandeau, Edward P., to Akzona Incorporated. Method of forming connector-cable with crimped electrical terminations. 4,288,917, Cl. 29-860.000.
Brandenburg, John T.: *See*—
Eng, King D.; Brandenburg, John T.; Lee, Kung-You; and McMahon, Matthew A., 4,289,810, Cl. 427-230.000.
Brandstetter, Aharon. Eyeglasses of the variable-lens type, and positioning member particularly useful therewith. 4,289,386, Cl. 351-128.000.
Brandt, Bertil, to Trelleborg AB. Mill lining. 4,289,279, Cl. 241-102.000.
Brannegan, Daniel P.: *See*—
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,289,704, Cl. 260-345.80R.
Brasseur, Yves: *See*—
Weber, Heinrich; Dungs, Horst; Wollenhaupt, Karl-Heinz; Brasseur, Yves; Birscheidt, Henri; and Beckmann, Franz, 4,289,500, Cl. 44-15.00R.
Brazdil, Pavel: *See*—
Minshull, John F.; and Brazdil, Pavel, 4,290,084, Cl. 358-260.000.
Brearley, Malcolm: *See*—
Dufft, Jurgen; and Brearley, Malcolm, 4,289,358, Cl. 303-22.00R.
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., to Pfizer Inc. Preparation of gamma-pyrones. 4,289,704, Cl. 260-345.80R.
Brent, Albert: *See*—
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,289,502, Cl. 48-62.00R.
Bridgestone Tire Company Limited: *See*—
Abe, Masaru; Sakai, Yoshihiro; Enoki, Yasutaka; and Sawada, Noriyasu, 4,289,183, Cl. 152-209.00B.
Motomura, Kenichi; Tansei, Hikaru; and Abe, Masaru, 4,289,184, Cl. 152-354.00R.
Sato, Takeshi; and Kojima, Hiroshi, 4,289,182, Cl. 152-209.00R.
Brimmer, Alan: *See*—
Trotsky, Alex; and Brimmer, Alan, 4,289,568, Cl. 156-518.000.
Briody, Robert G.; and Cummings, Frances M., to PPG Industries, Inc. Method for increasing the ultra-violet light transmittance of ethylene glycol. 4,289,593, Cl. 204-158.00R.
Brisabois, Roger, to Regie Nationale des Usines Renault. Housings of gearboxes for power units. 4,289,045, Cl. 74-701.000.

Brissey, David C.: *See—*
Carlson, Denny L.; Brissey, David C.; and Vriezelaar, Lee W., 4,288,951, Cl. 52-94.000.
Bristol-Myers Company: *See—*
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,289,876, Cl. 542-416.000.
Brockmann, Heinz, to Klockner-Humboldt-Deutz Akt. Multi-stage cyclone separator. 4,289,611, Cl. 209-144.000.
Brodowski, Walter: *See—*
Zengel, Hans-Georg; Wallrabenstein, Michael; and Brodowski, Walter, 4,289,869, Cl. 528-73.000.
Brogardh, Torgny: *See—*
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Brognano, R. Joseph; and Buonasera, Albert. Energy conserving system for use with heating and/or hot water systems and the like. 4,289,954, Cl. 219-307.000.
Brown Boveri Turbomachinery, Inc.: *See—*
Ernst, Hermann, 4,288,980, Cl. 60-39.230.
Brown, Edgar D., Jr., to General Electric Company. Silicone diffusion pump fluids. 4,289,891, Cl. 556-453.000.
Brown, William R., to FMC Corporation. Vibrator with eccentric weights. 4,289,042, Cl. 74-61.000.
Brownhill, Richard D.; and Wilkinson, Darcy B., Jr., to Mead Corporation, The. Activated sorbtion paper and products produced thereby. 4,289,513, Cl. 55-387.000.
Bruckner, Ernst: *See—*
Bolldorf, Kurt; and Bruckner, Ernst, 4,289,086, Cl. 112-221.000.
Bruelle, Georges, to General Foods France S.A. Sizzling and crunchy chocolate candy. 4,289,790, Cl. 426-93.000.
Brunner, Heinrich; Drebinger, Peter; Hoehne, Peter; Hoisl, Johann; Kochanowski, Guenter; and Wimmer, Walter, to Siemens Aktiengesellschaft. Circuit arrangement for monitoring the state of signal systems, particularly traffic light signal systems. 4,290,136, Cl. 371-25.000.
Bruns, Klaus: *See—*
Schaper, Ulf-Armin; and Bruns, Klaus, 4,289,660, Cl. 252-522.00R.
Brunswick Corporation: *See—*
Weronke, Robert B.; and Bankstahl, Herbert A., 4,289,488, Cl. 440-57.000.
Brusq, Roger: *See—*
Marti, Bernard; Poignet, Alain; Savary, Jean-Yves; and Brusq, Roger, 4,290,062, Cl. 340-721.000.
Bucher, John H.; Butler, John F.; and Held, John F., to Jones & Laughlin Steel Corporation. High strength cold finished bars. 4,289,548, Cl. 148-12.00B.
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Bugaut, Andree; Grollier, Jean-Francois; and Vandenboosche, Jean-Jacques, to L'Oreal. Oxidative dye compositions containing a 2,5-dihydroxyphenylalkanoic acid or salts thereof as antioxidant. 4,289,495, Cl. 8-406.000.
Bull, David W., to Nartron Corporation. Lamp assembly light shield and retaining means. 4,290,092, Cl. 362-61.000.
Bunker Ramo Corporation: *See—*
Nijman, John P., 4,288,918, Cl. 29-868.000.
Buonasera, Albert: *See—*
Brognano, R. Joseph; and Buonasera, Albert, 4,289,954, Cl. 219-307.000.
Burant, Walter, Jr.: *See—*
Knopp, Paul V.; and Burant, Walter, Jr., 4,289,626, Cl. 210-616.000.
Burgener, David B., to Chemetron Corporation. Golfball center freezer. 4,288,994, Cl. 62-381.000.
Burke, Barry E.: *See—*
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., 4,290,118, Cl. 365-183.000.
Burkhardt, Rudolf; Meyer, Gunther; Schmidt, Reinhard; and Thewalt, Klaus, to Dynamit Nobel Aktiengesellschaft. Method for the preparation of oligomeric alkylene terephthalates. 4,289,895, Cl. 560-92.000.
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Catiller, Robert D.; and Forbes, Brian K., 4,290,106, Cl. 364-200.000.
Hergenhan, Odo, 4,290,101, Cl. 363-65.000.
Muller, Harold, 4,289,979, Cl. 307-272.00A.
Burroughs Wellcome Co.: *See—*
Caldwell, Albert G.; and Whittaker, Norman, 4,289,707, Cl. 260-404.500.
Lee, Grahame R., 4,289,711, Cl. 260-456.00P.
Bush, Charles N., to B. F. Goodrich Company, The. Emulsion polymerization process with low emulsifier concentration. 4,289,667, Cl. 260-23.0XA.
Buske, Gary R., to Dow Chemical Company, The. Method and composition for removing sulfide-containing scale from metal surfaces. 4,289,639, Cl. 252-87.000.
Butcher, Harry L. Solar panel unit and system for heating circulating air. 4,289,117, Cl. 126-436.000.
Butler Greenwich Inc.: *See—*
Cooperstein, Gerald; Lanza, Richard C.; and Sohval, A. Robert, 4,289,969, Cl. 250-445.00T.
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Buxbaum, Lothar, to Ciba-Geigy Corporation. Transesterification process. 4,289,896, Cl. 560-92.000.
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Medcalf, Eugene C., 4,289,501, Cl. 44-56.000.
Byars, Robert W.: *See—*
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Bystricky, Gustav, to Cerberus AG. Method and apparatus for intrusion detection by using sonic receivers. 4,290,058, Cl. 340-566.000.
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Nehring, John R., 4,289,158, Cl. 137-205.000.
C-R-O, Inc.: *See—*
Griebeler, Elmer L., 4,289,950, Cl. 219-124.340.
Cabaret, Pierre M.; Daboust, Maurice B.; and Engerran, Pierre R., to Union Siderurgique du Nord et de l'est de la France (USINOR). Process and device for controlling the flatness of a cold-rolled metal sheet. 4,289,005, Cl. 72-12.000.
Cadars, Patrick; and Hellouin di Cenival, Bruno, to Societe Anonyme Francaise du Ferodo. Expansion tank and water box device for heat exchanger, such as a radiator of a motor vehicle. 4,289,507, Cl. 55-195.000.
Cajigas, Stanley D., to M P Food Technology, Inc. Instant yogurt composition. 4,289,788, Cl. 426-61.000.
Cajigas, Stanley D., to M P Food Technology, Inc. Instant yogurt drink composition. 4,289,789, Cl. 426-61.000.
Calder, G. Vincent; and Mercurio, Andrew, to Rohm and Haas Company. Acrylic thickener for publication gravure inks, method of preparing said thickener, ink containing the same and method of printing. 4,289,678, Cl. 260-33.6UA.
Caldwell, Albert G.; and Whittaker, Norman, to Burroughs Wellcome Co. Nitrogen heterocycles. 4,289,707, Cl. 260-404.500.
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Schnur, Andrew C.; and Wilhelm, Donald M., 4,288,998, Cl. 64-9.00R.
Campbell, Brian D., to Glacier Metal Company, Limited, The. Bearings. 4,288,895, Cl. 29-149.50C.
Campbell, Simon F.; Danilewicz, John C.; Evans, Anthony G.; and Ham, Allan L., to Pfizer Inc. 1-Piperidinophthalazines as cardiac stimulants. 4,289,772, Cl. 424-250.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Perrault, Guy; Lavertu, Roger; and Drolet, Jean-Francois, 4,289,551, Cl. 149-19.400.
Canadian Red Cross Society, The: *See—*
Rock, Gail A.; and Palmer, Douglas S., 4,289,691, Cl. 260-112.00B.
Canavesio, Franco; and Ceruti, Rodolfo, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of and apparatus for audiometrically determining the acoustic impedance of a human ear. 4,289,143, Cl. 128-746.000.
Cannon, John W., to General Electric Company. Load break switch arc suppression. 4,289,941, Cl. 200-146.00R.
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Caporini, John I.: *See—*
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Capuano, Terry D., to Lamson & Sessions Co., The. Fastener. 4,289,181, Cl. 411-187.000.
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Strehler, Richard; and Bartl, Max, 4,289,223, Cl. 192-48.910.
Carl Still GmbH & Co. KG, Firma: *See—*
Tippmer, Kurt, 4,289,647, Cl. 252-373.000.
Weber, Heinrich; Dungs, Horst; Wollenhaupt, Karl-Heinz; Brasseur, Yves; Birscheidt, Henri; and Beckmann, Franz, 4,289,500, Cl. 44-15.00R.
Carlson, Denny L.; Brissey, David C.; and Vriezelaar, Lee W., to Scientific Applications Incorporated. Auxiliary insulated roof system. 4,288,951, Cl. 52-94.000.
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., to International Business Machines Corporation. Improved solder interconnection between a semiconductor device and a supporting substrate. 4,290,079, Cl. 357-71.000.
Carpenter, David A.; Kossoff, George; and Radovanovich, George D. Signal processing system. 4,289,140, Cl. 128-660.000.
Carroll, Robert G.; Caporini, John I.; and Egan, William J., to United Technologies Corporation. Combustor for gas dynamic laser. 4,290,031, Cl. 331-94.50G.
Carter, Hudson R.; Kidwell, John H.; and Prueter, William P., to Babcock & Wilcox Company, The. Stacked re-entrant arm vapor-liquid separator. 4,289,514, Cl. 55-398.000.
Carter, Tommie B.: *See—*
Hallack, Richard D.; and Carter, Tommie B., 4,289,616, Cl. 210-101.000.
Casabona, Richard J.: *See—*
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Casamayor, Jorge, to Plaskolite Inc. Extruded wall paneling system. 4,289,818, Cl. 428-43.000.
Cashion, Jerry L., to Span-Deck, Inc. Combination bed concrete casting apparatus. 4,289,293, Cl. 249-74.000.
Casparian, Robert E.: *See—*
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 4,289,578, Cl. 159-47.0WL.

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Hudec, Gustav; Keil, Karl-Heinz; Kohler, Volker; and Rosenbusch, Kurt, 4,289,665, Cl. 260-21.000.
Cassidy, James L. Method and apparatus for obtaining mechanical energy from low temperature heat sources. 4,288,989, Cl. 60-685.000.
Catalano, Joseph. Folding gate. 4,289,189, Cl. 160-160.000.
Catan, Robert, to Dynaforce Corporation. Plastic strip closures and methods of protecting the same. 4,289,190, Cl. 160-332.000.
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Bagby, Thomas L.; and Coombs, Gale C., 4,289,090, Cl. 118-630.000.
Hopkins, Michael F., 4,289,047, Cl. 74-713.000.
Warner, Hubert H., 4,289,091, Cl. 118-642.000.
Wernert, Gregory M., 4,289,207, Cl. 169-30.000.
Cather, Douglas A., Jr.; and Benjamin, Martin E., to Garlock Inc. Hydraulic motor balancing ring seal. 4,289,318, Cl. 277-12.000.
Cather, Douglas A., Jr., to Garlock Inc. Pressure shaft seal and method. 4,289,321, Cl. 277-152.000.
Catiller, Robert D.; and Forbes, Brian K., to Burroughs Corporation. Microprocessor system with source address selection. 4,290,106, Cl. 364-200.000.
CBS Inc.: *See*—
Marshall, Trevor J., Jr.; and Dworkin, Darryl R., 4,289,307, Cl. 272-52.500.
Cederholm, Allen E.: *See*—
Schmidt, Henry, Jr.; Cederholm, Allen E.; and Zievers, James F., 4,289,630, Cl. 210-785.000.
Celanese Corporation: *See*—
Harris, Marvin E., Jr.; and Thigpen, Hubert H., 4,289,912, Cl. 568-422.000.
Penley, Percy A., 4,289,080, Cl. 111-3.000.
Scott, Robert H.; Thigpen, Hubert H.; and Wood, Frank, Jr., 4,289,708, Cl. 260-413.000.
Shelley, Ralph R., Jr., 4,289,811, Cl. 427-239.000.
Celfil Company Establishment: *See*—
Muller, Paul A.; and Muster, Hans, 4,289,725, Cl. 264-287.000.
Central Glass Company, Limited: *See*—
Hayakawa, Masanori; and Nishimura, Satoshi, 4,289,746, Cl. 423-633.000.
Centronics Data Computer Corp.: *See*—
Morse, Timothy C., 4,290,116, Cl. 364-900.000.
Cerberus AG: *See*—
Bystricky, Gustav, 4,290,058, Cl. 340-566.000.
Trunner, Josef; and Both, Marinus, 4,289,039, Cl. 74-2.000.
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Chabot, Ovila. Coded electrical security system for vehicles, such as automobiles. 4,290,046, Cl. 340-63.000.
Chabre, Andre; de Saint-Ours, Gerard; and Vrillon, Bernard. Protective device for an inertia wheel rotating. 4,289,043, Cl. 74-609.000.
Chaiko, Walter M., to Ingersoll-Rand Company. Friction rock stabilizer and method of forming same, and a method of stabilizing an earth structure. 4,289,426, Cl. 405-259.000.
Chalmers, Alexander A.; and Gailey, J. Lynn, to Alcan Aluminum Corporation. Horizontal siding panel system with vertical stringers. 4,288,958, Cl. 52-478.000.
Chamberlin, James W.: *See*—
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,289,782, Cl. 424-273.00B.
Chambers, J. Bruce; and Dotter, Richard J., Sr., to Eaton Corporation. Hydraulic control system. 4,289,221, Cl. 192-3.570.
Chan, John K., to Union Carbide Corporation. Process for preparing N-alkyl-nitroanilines. 4,289,907, Cl. 564-399.000.
Chandler Evans Inc.: *See*—
Noell, Godwin L.; and Haynes, Paul L., Jr., 4,289,460, Cl. 418-78.000.
Chemetron Corporation: *See*—
Burgener, David B., 4,288,994, Cl. 62-381.000.
Chenil Cont GS S.R.L.: *See*—
Tani, Fedora, 4,288,973, Cl. 57-24.000.
Chernyavsky, Vladimir P.: *See*—
Aroshidze, Jury V.; Kadi-Ogly, Ibragim A.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; Fomin, Boris I.; and Yankov, Anatoly F., 4,289,984, Cl. 310-54.000.
Cheswick, William R.: *See*—
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Chevron Research: *See*—
Freenor, Francis J., III; and Koerber, Barbara M., 4,289,909, Cl. 568-315.000.
Schinski, William L.; and Freenor, Francis J., III, 4,289,701, Cl. 260-343.600.
Chevron Research Company: *See*—
Jaffe, Joseph, 4,289,653, Cl. 252-453.000.
Lewis, Robert A.; and Honnen, Lewis R., 4,289,634, Cl. 252-32.500.
Chiang, John S.; Munday, Theodore F.; and Ilardi, Joseph M., to FMC Corporation. Method of producing crystalline sodium aluminum phosphate. 4,289,739, Cl. 423-306.000.
Child, Edward T.: *See*—
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,289,502, Cl. 48-62.00R.
Child, Richard D.; and Tulinus, Jan R., to United States of America, Air Force. Fixed skewed wing airborne vehicle. 4,289,287, Cl. 244-45.00R.
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Clark, Leland C., Jr.; and Moore, Robert E., 4,289,499, Cl. 23-230.00B.
Childress, David L.: *See*—
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Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth, Zoltan, 4,289,894, Cl. 560-82.000.
Chisolm, Sherril H. Case labeler. 4,289,562, Cl. 156-364.000.
Chloride Group Limited: *See*—
Evans, Christopher P., 4,289,176, Cl. 141-35.000.
Cho, Yong K.: *See*—
Bailey, James E.; and Cho, Yong K., 4,289,853, Cl. 435-177.000.
Chou, Ta-Sen, to Eli Lilly and Company. Process for preparing 2-chlorosulfinylazetidinones. 4,289,695, Cl. 260-239.00A.
Chow, Vincent Y. S., to Ellsworth, Chow & Murphy, Inc. Protective system. 4,290,056, Cl. 340-538.000.
Christena, Ray C., to Vulcan Materials Company. Stabilization of chlorinated phenols. 4,289,587, Cl. 203-6.000.
Christensen, Marvin M.; Zachary, Richard E.; and Dupont, Andra P., to Dow Chemical Company, The. Fusion processing of synthetic thermoplastic resinous materials. 4,289,807, Cl. 427-195.000.
Christenson, Roger M.; Maska, Rudolf; Dowbenko, Rostyslawa; and Hockswender, Thomas R., to PPG Industries, Inc. Base-solubilized acrylic polymers and aqueous resinous dispersions of acrylic polymers and epoxy resins. 4,289,674, Cl. 260-29.6NR.
Christiansen, Gary D.: *See*—
Hoskins, Michael K.; and Christiansen, Gary D., 4,289,648, Cl. 252-408.000.
Chrysler Corporation: *See*—
Mikel, Steve A.; and Blomquist, Alfred P., 4,289,048, Cl. 74-733.000.
Chu, Albert E., to E-Y Laboratories, Inc. Immunological determination using lectin. 4,289,747, Cl. 424-1.000.
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Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,289,731, Cl. 422-206.000.
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A. Method of making billets. 4,288,907, Cl. 29-527.600.
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Chynoweth, David P.: *See*—
Tarman, Paul B.; and Chynoweth, David P., 4,289,625, Cl. 210-603.000.
Ciba-Geigy Corporation: *See*—
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Reinehr, Dieter, 4,289,905, Cl. 564-248.000.
Rody, Jean; and Slongo, Mario, 4,289,686, Cl. 260-45.8NT.
Cichelli, Richard J.; Thompson, Michael Q.; and Cheswick, William R., to American Newspaper Publishers Association. Method and apparatus for testing membership in a set through hash coding with allowable errors. 4,290,105, Cl. 364-200.000.
Cincinnati Electronics Corporation: *See*—
Wissel, F. A.; and Kiliman, D. A., 4,290,143, Cl. 455-38.000.
Citizen Watch Company Limited: *See*—
Kume, Kazunari; and Ohno, Hideshi, 4,290,131, Cl. 368-71.000.
Ciucani, Mario. Automatic machine for zig-zag stitching of tubular elements. 4,289,083, Cl. 112-157.000.
Civitello, John P. Electrostatic transducers. 4,289,936, Cl. 179-111.00R.
Clark, Earl S., to Federal Products Corporation. Measurement system for machine parts. 4,289,382, Cl. 350-331.00R.
Clark, Leland C., Jr.; and Moore, Robert E., to Childrens Hospital Medical Center; and Suntech, Inc. Selecting perfluorocarbon compounds for synthetic blood. 4,289,499, Cl. 23-230.00B.
Clarke, William A.: *See*—
Stanwood, Jay W.; Clarke, William A.; and MacLeane, Johannes, 4,289,557, Cl. 156-171.000.
Clay, Burton R., to RCA Corporation. Technique for recording a hologram suitable for use in optical retrieval system. 4,289,372, Cl. 350-3.830.
Clayton, John P.: *See*—
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,289,779, Cl. 424-263.000.
Claytor, Thomas N., to United States of America, Energy. Method and means of passive detection of leaks in buried pipes. 4,289,019, Cl. 73-40.50A.
Clear, Elmer E., to Phillips Petroleum Company. Lost circulation material for sealing permeable formations. 4,289,632, Cl. 252-8.5LC.
Clifford, Christine H.: *See*—
Dell, Dorothy G.; and Clifford, Christine H., 4,289,137, Cl. 128-482.000.
Coal Industry (Patents) Limited: *See*—
Howard, Terence R., 4,289,356, Cl. 299-33.000.
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Boone, Gary W.; and Cochran, Michael J., 4,290,121, Cl. 365-233.000.

Cocks, Philip J.; and Newton, Derek A., to Dunlop Limited. Pipe jointing. 4,288,906, Cl. 29-526.00R.

Coggins, Robert W.; and Miles, Bert B., to Combustion Engineering, Inc. Steam generator. 4,289,093, Cl. 122-197.000.

Cohen, Abraham B.; and Gervay, Joseph E., to Du Pont de Nemours, E. I., and Company. Dry-developing photosensitive dry film resist. 4,289,841, Cl. 430-253.000.

Cohen, Solomon E.: *See—*
Golczewski, Roman; Seach, Barry G.; and Cohen, Solomon E., 4,289,624, Cl. 210-404.000.

Cohenca, Alain: *See—*
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Cohnen, Wolfgang: *See—*
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Coker, Thomas G.: *See—*
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Cole, Jimmy R., to Syntron, Inc. Remote control cable depth control apparatus. 4,290,124, Cl. 367-18.000.

Cole, Robert: *See—*
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Coleman, David F.: *See—*
Long, Lennart E.; Steele, Roger K.; Coleman, David F.; and Gustafson, Ralph A., 4,288,926, Cl. 33-174.00P.

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Collender, Robert B. Stereoscopic television (unaided) on standard bandwidth-method and apparatus. 4,290,083, Cl. 358-88.000.

Collura, Peter C.; and Baker, Thomas R., to Kliklok Corporation. Apparatus for adhesively bonding a carton. 4,289,491, Cl. 493-124.000.

Combustion Engineering, Inc.: *See—*
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Liljedahl, Gregory N.; and Moffat, Bruce K., 4,288,979, Cl. 60-39.120.
McGee, John K., 4,289,157, Cl. 137-72.000.
McGee, John K., 4,289,199, Cl. 166-65.00R.

Comet, Inc.: *See—*
Yano, Robert A., 4,289,481, Cl. 432-96.000.

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Royer, Gerard, 4,290,074, Cl. 346-75.000.

Comyns-Carr, Cecil A.; and Platts, Michael J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the. Devices for extracting energy from waves. 4,289,455, Cl. 417-332.000.

Connolly, David C. A.; and Shutt, Harry, to General Electric Company Limited, The. Electronic apparatus for the display of information received over a line. 4,289,930, Cl. 179-2.0TV.

Conoco, Inc.: *See—*
Mack, Mark P., 4,289,679, Cl. 260-33.6PQ.

Conor Corporation: *See—*
Herndon, Marion E., Jr., 4,289,510, Cl. 55-294.000.

Container Corporation of America: *See—*
Helms, Charles R., 4,289,252, Cl. 220-308.000.

Container Graphics Corporation: *See—*
Simpson, Jack R., 4,289,492, Cl. 493-371.000.

Continental Group, Inc., The: *See—*
Jordan, Thomas F., 4,289,250, Cl. 220-269.000.
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Control Data Corporation: *See—*
Strom, Richard A.; Bergman, Clark; and Michalek, Paul F., 4,289,364, Cl. 339-17.0CF.

Cook, Edward H., Jr.: *See—*
Lazarz, Christine A.; Cook, Edward H., Jr.; and Scripa, Lesleigh V., 4,289,600, Cl. 204-296.000.

Cook, Francis E., to Dearborn Rubber Company. Belt type expansion joints. 4,289,338, Cl. 285-229.000.

Coombs, Gale C.: *See—*
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Cooperstein, Gerald; Lanza, Richard C.; and Sohval, A. Robert, to Butler Greenwich Inc. Radiation imaging apparatus. 4,289,969, Cl. 250-445.00T.

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Pieper, Paul; and Cordier, Walter, 4,289,054, Cl. 83-113.000.

Corfield, John C., to Unimax Switch Limited. Key-operated device for access control system. 4,289,001, Cl. 70-346.000.

Cormier Cardiac Systems, Inc.: *See—*
Cormier, Denny C., 4,289,141, Cl. 128-713.000.

Cormier, Denny C., to Cormier Cardiac Systems, Inc. Method and apparatus for extracting systolic valvular events from heart sounds. 4,289,141, Cl. 128-713.000.

Cornelius, Rorger W.; Hill, James D.; and Quinn, Paul A., Jr., to International Business Machines Corporation. Multilingual ink jet printer. 4,289,411, Cl. 400-126.000.

Cornils, Boy: *See—*
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Corning Glass Works: *See—*
Bailey, Alan C.; and Miller, Stephen B., 4,289,517, Cl. 65-3.00A.
Bailey, Alan C.; and Miller, Stephen B., 4,289,522, Cl. 65-144.000.
Orso, Francis L., 4,289,538, Cl. 106-286.500.

Corrigan, Francis R., to General Electric Company. Polycrystalline cubic boron nitride abrasive and process for preparing same in the absence of catalyst. 4,289,503, Cl. 51-307.000.

Cosco Industries, Inc.: *See—*
MacGregor, Francis W., 4,289,070, Cl. 101-327.000.

Courtaulds Limited: *See—*
Dunbar, John H.; and Gray, Kenneth L., 4,289,471, Cl. 425-373.000.

Cousse, Henri; and Mouzin, Gilbert, to Pierre Fabre S.A. 2-Benzoyl-4-nitroanilides and their use as medicaments. 4,289,770, Cl. 424-248.540.

Crawford, Harry I.: *See—*
Powers, Vernon B.; and Crawford, Harry I., 4,289,977, Cl. 307-270.000.

Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; Martone, James F.; and Sabad, Joseph J., to International Business Machines Corporation. Adhesive correction composition and method of use. 4,289,666, Cl. 260-23.00H.

Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; and Sabad, Joseph J., to International Business Machines Corporation. Pressure sensitive correction composition and method of use. 4,289,670, Cl. 260-28.5AV.

Crenshaw, Ronnie R.: *See—*
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,289,876, Cl. 542-416.000.

Cripe, Herman S. Container. 4,289,249, Cl. 220-22.000.

Crittenden, David E.; Angarola, Barry R.; Nix, Robert J.; and Meier, William A., to Signode Corporation. Tension sensing mechanism for power-operated push-type strapping and sealing tool. 4,289,175, Cl. 140-93.400.

Cross, Barrington: *See—*
Spatz, David M.; and Cross, Barrington, 4,289,903, Cl. 564-20.000.

Cross, Carroll N. Display book apparatus. 4,288,935, Cl. 40-120.000.

Csaky, Thomas J.; Gauntt, Sibbley P.; and Heard, Ralph L., Jr., to Du Pont de Nemours, E. I., and Company. Process for making integrated racket strings from monofilaments. 4,288,977, Cl. 57-297.000.

CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Canavesio, Franco; and Ceruti, Rodolfo, 4,289,143, Cl. 128-746.000.

Csurgay, Gregory; and Reeder, Willes W., to Fail Safe Industries, Inc. Control system for vehicle brake valve. 4,289,219, Cl. 192-2.000.

Cummings, Frances M.: *See—*
Briody, Robert G.; and Cummings, Frances M., 4,289,593, Cl. 204-158.00R.

Currer, John T.: *See—*
Kielma, Ervin J.; Schabowski, Albin J.; and Currer, John T., 4,288,909, Cl. 29-568.000.

Curtil, Remi, to Societe d'Etudes de Machines Thermiques S.E.M.T. Method and apparatus for improving the gas flow in an internal combustion engine exhaust manifold. 4,288,988, Cl. 60-605.000.

Cutlip, David S.; and Cutlip, Judyth. Turn signalling apparatus. 4,290,048, Cl. 340-134.000.

Cutlip, Judyth: *See—*
Cutlip, David S.; and Cutlip, Judyth, 4,290,048, Cl. 340-134.000.

Cutrara, Anthony. Firewood package. 4,289,237, Cl. 206-443.000.

Czauderna, Bernhard; Einwiller, Andreas; and Bott, Kaspar, to BASF Aktiengesellschaft. Binders, impregnating agents and coating agents based on an aqueous dispersion of an amide-containing copolymer. 4,289,676, Cl. 260-29.60H.

Daboust, Maurice B.: *See—*
Cabaret, Pierre M.; Daboust, Maurice B.; and Engerran, Pierre R., 4,289,005, Cl. 72-12.000.

Dahlberg, J. Robert, to PPG Industries, Inc. Method of thermally inducing bending moment forces to sever a glass sheet along a score. 4,289,261, Cl. 225-2.000.

Dai-Ichi Seiko Co., Ltd.: *See—*
Kohno, Kaname, 4,289,282, Cl. 242-71.800.

Daicel Chemical Industries, Ltd.: *See—*
Kubo, Masayoshi; Nakanishi, Michio; and Kimura, Mamoru, 4,289,873, Cl. 528-357.000.

Daicel Ltd.: *See—*
Usami, Akira; Uebayashi, Toshiaki; Sato, Koji; and Goda, Tomoko, 4,289,130, Cl. 128-287.000.

D'Alessandro, A. F.: *See—*
Hunter, James B.; McGuire, George; D'Alessandro, A. F.; and Lawlor, Larry L., 4,289,652, Cl. 252-437.000.

D'Amico, John J., to Monsanto Company. Imides derived from 2-thioxo-3-benzox(thia)azoline acetic, and propionic acids. 4,289,886, Cl. 548-165.000.

Dan, Takehiro: *See—*
Gunji, Koki; and Dan, Takehiro, 4,289,533, Cl. 75-138.000.

D'Andrade, Bruce M., to Arco Industries Ltd. Toy air pistol with hollow breech slide. 4,289,109, Cl. 124-67.000.

Danilewicz, John C.: *See—*
Campbell, Simon F.; Danilewicz, John C.; Evans, Anthony G.; and Ham, Allan L., 4,289,772, Cl. 424-250.000.

Dargel, William O.: *See—*
Sternberg, Stanley R.; Lougheed, Robert M.; and Dargel, William O., 4,290,049, Cl. 340-146.3MA.

Daughenbaugh, Randall J.: *See—*
Becker, Eckhart R.; Daughenbaugh, Randall J.; and Milligan, Barton, 4,289,908, Cl. 564-490.000.

Davidson, Craig R.; and Sedlak, John M., to General Electric Company. Oxygen evolution with improved Mn stabilized catalyst. 4,289,591, Cl. 204-129.000.

Davis, Edd C.: *See—*
Davis, Marvin L.; Davis, Edd C.; and Green, Albert R., 4,289,420, Cl. 404-35.000.

Davis, Howard F., Jr.; and Persson, John A., to Lectromelt Corporation. Method of producing cement. 4,289,537, Cl. 106-100.000.

Davis, Marvin L.; Davis, Edd C.; and Green, Albert R. Wooden mat. 4,289,420, Cl. 404-35.000.

Davis, Robert H.; and Piotrowski, Alfred B., to Mobil Oil Corporation. Aqueous lubricant compositions. 4,289,636, Cl. 252-49.300.

Davis, Stephen H., to Water Refining Company, Inc. Water softening and reverse osmosis system. 4,289,617, Cl. 210-109.000.

Davis, Thomas J.: *See—*
Russell, James T.; and Davis, Thomas J., 4,289,987, Cl. 310-26.000.

Dayco Corporation: *See—*
Haren, Doyle V.; and Edwards, William M., 4,289,555, Cl. 156-149.000.
Kleykamp, Donald L.; and Holden, Homer N., 4,289,077, Cl. 105-199.00C.

DCA Industries Limited: *See—*
Duncan, Michael E.; Whittington, Philip J.; and Kimber, Michael P., 4,289,111, Cl. 126-391.000.

Dearborn Rubber Company: *See—*
Cook, Francis E., 4,289,338, Cl. 285-229.000.

Dearnaley, Geoffrey, to United Kingdom Atomic Energy Authority. Inhibition of fretting corrosion of metals. 4,289,544, Cl. 148-4.000.

Debono, Manuel, to Eli Lilly and Company. Derivatives of A-30912D nucleus. 4,289,692, Cl. 260-112.50R.

Declerco, Marc A.; and Margant, Gerard, to Societe Nationale Industrielle Aerospatiale. Device for limiting the flapping movements of a rotary-wing aircraft main rotor. 4,289,448, Cl. 416-140.000.

Deere & Company: *See—*
Dobberpuhl, Dale R., 4,289,224, Cl. 192-50.000.
Latham, David D.; Von Fumetti, Cyril W.; and Miller, Wayne R., 4,289,096, Cl. 123-198.00E.

Deffeyes, Robert J.; and Armstrong, Harris W., to Graham Magnetics, Inc. Metal powder paint composition. 4,289,534, Cl. 106-1.140.

de Fraine, Paul: *See—*
Worthington, Paul A.; de Fraine, Paul; Rathmell, William G.; and Gatehouse, Diana M., 4,289,526, Cl. 71-92.000.

DeGeorge, Charles W., to Exxon Research & Engineering Co. Cryogenic fractionator gas as stripping gas of fines slurry in a coking and gasification process. 4,289,603, Cl. 208-8.0LE.

Degussa Aktiengesellschaft: *See—*
Voigt, Carl; Kleinschmit, Peter; and Walter, Eberhard, 4,289,741, Cl. 423-376.000.

Deibert, David D. Wind powered electrical generator. 4,289,970, Cl. 290-44.000.

De Klerk, Pieter B.; and Velthuysen, Andries G., to Fowler Holdings Limited. Compactor. 4,289,422, Cl. 404-124.000.

Delamontagne, Robert P. Management teaching game apparatus and method. 4,289,313, Cl. 273-256.000.

De Lange, Michael D.: *See—*
Theron, Jacob J.; Bout, Bernardus J.; Van Wyk, Jacobus P.; and De Lange, Michael D., 4,290,021, Cl. 324-429.000.

Dell, Dorothy G.; and Clifford, Christine H. Sports brassiere. 4,289,137, Cl. 128-482.000.

DeLong, Donald C., to Eli Lilly and Company. Antiviral combinations. 4,289,773, Cl. 424-250.000.

Delves, Ronald F.: *See—*
Barnes, Robin R.; Delves, Ronald F.; and Slasor, James F., 4,289,996, Cl. 318-38.000.

Dempsey, Russell M.; Coker, Thomas G.; La Conti, Anthony B.; and Fragala, Anthony R., to General Electric Company. Production of halogens by electrolysis of alkali metal halides in an electrolysis cell having catalytic electrodes bonded to the surface of a solid polymer electrolyte membrane. 4,289,590, Cl. 204-98.000.

Denkewalter, Robert G.; Kolc, Jaroslav; and Lukasavage, William J., to Allied Corporation. Macromolecular highly branched homogeneous compound based on lysine units. 4,289,872, Cl. 528-328.000.

De Poorter, Adriaan W.: *See—*
Jacobs, Bernardus A. J.; De Poorter, Adriaan W.; and Zalm, Pieter, 4,290,075, Cl. 430-270.000.

Dereser, Ernst, to Owens-Corning Fiberglas Corporation. Glass fiber reinforced cements and process for manufacture of same. 4,289,536, Cl. 106-99.000.

de Saint-Ours, Gerard: *See—*
Chabre, Andre; de Saint-Ours, Gerard; and Vrillon, Bernard, 4,289,043, Cl. 74-609.000.

Desbrandes, Robert: *See—*
Norel, Guy; and Desbrandes, Robert, 4,289,025, Cl. 73-152.000.

DeSoto, Inc.: *See—*
Krajewski, John J., 4,289,675, Cl. 260-29.6CM.

Deussner, Herbert, to Klockner-Humboldt-Deutz AG. Apparatus for the mutli-step calcination of cement-clinker. 4,289,483, Cl. 432-106.000.

Deutsch Gold- und Silber-Scheideanstalt Vormals Roessler: *See—*
Nauroth, Peter; Kuhlmann, Robert; and Turk, Gunter, 4,289,681, Cl. 260-37.0SB.

Devlin, Daniel J., to Plessey Incorporated. Integrated circuit package and lead frame. 4,289,922, Cl. 174-52.0FP.

Dexter Corporation, The: *See—*
Elston, Colin; Hoffman, Herbert A.; and Murphy, H. Joseph, 4,289,580, Cl. 162-109.000.

Dhabhar, Dadi J.; and Shah, Nutan B., to Richardson-Vicks Inc. Zinc derivatives and their use in mouthwash compositions. 4,289,754, Cl. 424-52.000.

Dhabhar, Dadi J., to Richardson-Vicks Inc. Stable mouthwash compositions containing zinc and fluoride compounds. 4,289,755, Cl. 424-52.000.

Diachkov, Vasily M.: *See—*
Tikhonov, Valentin N.; Zhestkov, Vitaly I.; Shlykov, Gennady N.; Diachkov, Vasily M.; Mukhin, Viktor M.; and Zhigalov, Gennady V., 4,288,889, Cl. 19-236.000.

Didier Engineering GmbH: *See—*
Wagener, Dietrich; Flockenhaus, Claus; and Blase, Manfred, 4,289,585, Cl. 202-227.000.

Diesel Kiki Co., Ltd.: *See—*
Shibuya, Tsunenori, 4,289,453, Cl. 417-269.000.

Dieterich, Dieter: *See—*
Friederich, Klaus; Heinze, Gerhard; Reiff, Helmut; Michael, Dietrich; Schon, Manfred; Markusch, Peter; Haberland, Ulrich; Dieterich, Dieter; and Merten, Josef, 4,289,672, Cl. 260-29.2TN.

Digital Equipment Corporation: *See—*
Levy, John V.; Rodgers, David; Stewart, Robert E.; and Casabona, Richard J., 4,290,102, Cl. 364-200.000.
Stewart, Robert E.; Flahive, Barry J.; and Potter, David, 4,290,133, Cl. 370-85.000.

Dillon, Keith, to Singer Company, The. Decibel addition circuit. 4,290,111, Cl. 364-768.000.

DiPippo, Carmine A., to James River Graphics, Inc. Negative image diazography formulation with acid labile coupler, diazonium compound and carboxylic acid anhydride. 4,289,839, Cl. 430-177.000.

Disselbeck, Dieter; Neumann, Gerhard; Ott, Karl-Heinz; Strobel, Gunther; and Zalewski, Edwin, to Hoechst Aktiengesellschaft. Liquid filtration process. 4,289,627, Cl. 210-702.000.

Disselbeck, Dieter; and Richter, Rudolf, to Hoechst Aktiengesellschaft. Process for separating solids from liquid matter. 4,289,628, Cl. 210-703.000.

Dobberpuhl, Dale R., to Deere & Company. Independent wheel drive. 4,289,224, Cl. 192-50.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Mahncke, Jurgen; Weigele, Hans; and Hotz, Dieter, 4,288,881, Cl. 14-2.400.

Dolinsky, Josef. Combined tooth brush and gum massaging. 4,288,883, Cl. 15-110.000.

Dollenmayer, William L., to International Business Machines Corporation. Automatic typefont loader. 4,289,412, Cl. 400-171.000.

Donnally, William: *See—*
Smith, Chester L.; and Donnally, William, 4,289,960, Cl. 250-222.00R.

Donohue, John A.; and Paschke, Edward E., to Standard Oil Company (Indiana). 2,2',6,6'-Tetramethylbiphenyl-4,4'-diol polyesters. 4,289,870, Cl. 528-193.000.

Donovan, Terrence P. Security door. 4,288,944, Cl. 49-395.000.

Dorpmund, Heinz; and Oberpichler, Gerd, to Volkswagenwerk Aktiengesellschaft. Motor vehicle transmission. 4,289,044, Cl. 74-688.000.

Dorsey, Robert J., to Wehr Corporation. Press for refractory material and having removable core moving apparatus. 4,289,472, Cl. 425-415.000.

Dossett, Richard A.: *See—*
Grimm, Bernard J.; and Dossett, Richard A., 4,288,995, Cl. 62-382.000.

Dotter, Richard J., Sr.: *See—*
Chambers, J. Bruce; and Dotter, Richard J., Sr., 4,289,221, Cl. 192-3.570.

Double-E, Inc.: *See—*
McLean, Douglas K., 4,289,294, Cl. 251-62.000.

Douglass, Paul W.; and Trotta, Robert A., to Gillette Company, The. Shaving system with pivotally mounted razor cartridge. 4,288,920, Cl. 30-47.000.

Dow Chemical Company, The: *See—*
Buske, Gary R., 4,289,639, Cl. 252-87.000.
Christensen, Marvin M.; Zachary, Richard E.; and Dupont, Andra P., 4,289,807, Cl. 427-195.000.
Hayes, William V.; and Childress, David L., 4,289,656, Cl. 252-470.000.
Jinkins, C. Eugene; and Legler, Bobby, 4,289,814, Cl. 427-385.500.
Martin, Patrick H., 4,289,812, Cl. 427-379.000.
Pearce, Roscoe L.; and Martin, Charles W., 4,289,738, Cl. 423-228.000.
West, Walter H.; and Prueter, E. D., 4,288,896, Cl. 29-157.10R.

Dow Corning Corporation: *See—*
Kalinowski, Robert E.; and Vincent, Gary A., 4,289,859, Cl. 525-104.000.
Sawyer, David H.; Henige, Joseph A.; and Rauchholz, Alvin W., 4,289,572, Cl. 156-617.0SP.

Dowbenko, Rostyslawa: *See—*
Christenson, Roger M.; Maska, Rudolf; Dowbenko, Rostyslawa; and Hockswender, Thomas R., 4,289,674, Cl. 260-29.6NR.

Dragerwerk Aktiengesellschaft: *See—*
Warncke, Ernst; Schlobohm, Joachim; and Behnke, Jurgen, 4,289,238, Cl. 206-527.000.

Drebinger, Peter: *See—*
Brunner, Heinrich; Drebinger, Peter; Hoehne, Peter; Hoisl, Johann; Kochanowski, Guenter; and Wimmer, Walter, 4,290,136, Cl. 371-25.000.

Driver, Julian H.: *See—*
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,289,545, Cl. 148-6.300.

Drobot, Walter: *See—*
Lechavelier, Hubert A.; and Drobot, Walter, 4,289,531, Cl. 75-101.0BE.

Drolet, Jean-Francois: *See—*
Perrault, Guy; Lavertu, Roger; and Drolet, Jean-Francois, 4,289,551, Cl. 149-19.400.

Druschke, Frank; Margotte, Dieter; Tresper, Erhard; Bottenbruch, Ludwig; Cohnen, Wolfgang; and Hucks, Uwe, to Bayer Aktiengesellschaft. Process for the preparation of flame-resistant polycarbonates. 4,289,685, Cl. 260-45.70S.

Drythanol Ltd.: *See—*
Yarrow, Hyman; and Whitefield, Martin, 4,289,764, Cl. 424-243.000.

Dubinsky, Rudolf S.; Medovar, Boris I.; and Boiko, Georgy A. Method and apparatus for producing a solid-section ingot by electroslag remelting. 4,289,192, Cl. 164-470.000.

Dubow, Jerome, to Stop-A-Flat Corporation. Method for sealing porosity leaks in pneumatic tires. 4,289,805, Cl. 427-140.000.

Duda, Philip H. Directional antenna for long range T.V. signal reception. 4,290,069, Cl. 343-722.000.

Duda, Werner, to Roe International, Inc. Tape measure. 4,288,923, Cl. 33-138.000.

Dufft, Jurgen; and Brearley, Malcolm, to Girling Limited. Vehicle braking systems. 4,289,358, Cl. 303-22.00R.

Dukes, Connie H. Lock for slidable door. 4,289,343, Cl. 292-117.000.

Dulat, Joseph, to United States Borax & Chemical Corp. Mineral oil soluble borate compositions. 4,289,637, Cl. 252-49.500.

Dulin, Gerald F., to Astronautics Corporation of America. Single phase DC brushless motor. 4,289,998, Cl. 318-254.000.

Dunbar, John H.; and Gray, Kenneth L., to Courtaulds Limited. Apparatus for forming a sheet of dry wood pulp. 4,289,471, Cl. 425-373.000.

Duncah, Jimmie D.; and Ryan, Ben T. Fuel manifold for oval track racing cars. 4,289,714, Cl. 261-34.00R.

Duncan, Michael E.; Whittington, Philip J.; and Kimber, Michael P., to DCA Industries Limited. Frying apparatus. 4,289,111, Cl. 126-391.000.

Dungs, Horst: *See—*
Weber, Heinrich; Dungs, Horst; Wollenhaupt, Karl-Heinz; Brasseur, Yves; Birscheidt, Henri; and Beckmann, Franz, 4,289,500, Cl. 44-15.00R.

Duni Bila AB: *See—*
Andersson, Karl G. B., 4,289,253, Cl. 221-1.000.

Dunlop Limited: *See—*
Cocks, Philip J.; and Newton, Derek A., 4,288,906, Cl. 29-526.00R.
Wilde, Ralph, 4,289,186, Cl. 152-379.300.

Dunn, Harold K. Orthopedic appliance. 4,289,123, Cl. 128-84.00R.

Dunwald, Willi: *See—*
Lewalter, Jurgen; Merten, Rudolf; Zecher, Wilfried; and Dunwald, Willi, 4,289,868, Cl. 528-73.000.

Dupont, Andra P.: *See—*
Christensen, Marvin M.; Zachary, Richard E.; and Dupont, Andra P., 4,289,807, Cl. 427-195.000.

Du Pont de Nemours, E. I., and Company: *See—*
Cohen, Abraham B.; and Gervay, Joseph E., 4,289,841, Cl. 430-253.000.
Csaky, Thomas J.; Gauntt, Sibbley P.; and Heard, Ralph L., Jr., 4,288,977, Cl. 57-297.000.
Jones, C. Bradford; and Kinard, Richard D., 4,289,480, Cl. 432-8.000.

Duracell International Inc.: *See—*
Parsen, Frank E.; and Graham, Teresita O., 4,288,913, Cl. 29-623.500.

Dusedau, Klaus: *See—*
Block, Werner; Pilsak, Manfred; Dusedau, Klaus; and Greiler, Wolfgang, 4,290,097, Cl. 362-264.000.

Dvoskin, Grigory I.: *See—*
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,289,731, Cl. 422-206.000.

Dworkin, Darryl R.: *See—*
Marshall, Trevor J., Jr.; and Dworkin, Darryl R., 4,289,307, Cl. 272-52.500.

Dybel, Frank R.; and Dybel, William P. Load monitoring system with means for generating timing signals. 4,289,022, Cl. 73-862.640.

Dybel, William P.: *See—*
Dybel, Frank R.; and Dybel, William P., 4,289,022, Cl. 73-862.640.

Dyck, Richard G. Apparatus for generating energy from the rise and fall of tides. 4,288,985, Cl. 60-398.000.

Dynaforce Corporation: *See—*
Catan, Robert, 4,289,190, Cl. 160-332.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Burkhardt, Rudolf; Meyer, Gunther; Schmidt, Reinhard; and Thewalt, Klaus, 4,289,895, Cl. 560-92.000.

Dyneer Corporation: *See—*
Kraft, Derald H., 4,289,007, Cl. 72-58.000.

Dyroff, David R.; Graf, Gary F.; Kim, Keun Y.; and Suchanek, Walton F., Jr., to Monsanto Company. Calculus-inhibiting method and compositions. 4,289,753, Cl. 424-48.000.

E.A. Storz GmbH & Co., KG: *See—*
Weisser, Dieter; and Hafner, Franz, 4,289,300, Cl. 254-126.000.

E. J. Price (Developments) Limited: *See—*
Price, Ernest J., 4,289,458, Cl. 417-464.000.

E-Systems, Inc.: *See—*
Powers, Vernon B.; and Crawford, Harry I., 4,289,977, Cl. 307-270.000.

E-Y Laboratories, Inc.: *See—*
Chu, Albert E., 4,289,747, Cl. 424-1.000.

Easland Industries, Inc.: *See—*
Easland, James C., 4,288,941, Cl. 46-47.000.

Easland, James C., to Easland Industries, Inc. Trick rope having appearance of working lasso. 4,288,941, Cl. 46-47.000.

East/West Industries, Inc.: *See—*
Spinosa, Dominic J.; and Knoll, Frank, 4,289,286, Cl. 244-1.00R.

Eastman Kodak Company: *See—*
Specht, Donald P.; Houle, Conrad G.; and Farid, Samir Y., 4,289,844, Cl. 430-281.000.
Sylvester, Robert A., 4,289,840, Cl. 430-207.000.
Tan, Zoilo C. H.; Petrqpoulos, Constantine C.; and Rauner, Frederick J., 4,289,842, Cl. 430-270.000.
Wilson, John C.; and Yacobucci, Paul D., 4,289,865, Cl. 526-288.000.

Eaton Corporation: *See—*
Chambers, J. Bruce; and Dotter, Richard J., Sr., 4,289,221, Cl. 192-3.570.
Hammond, Howard A.; and Whitcomb, Paul H., 4,289,177, Cl. 144-2.00Z.
Paskert, Joseph H., 4,289,058, Cl. 411-451.000.

Eaton, Sargent S., Jr., to Mostek Corporation. AND-gate clock. 4,289,973, Cl. 307-448.000.

Eberhard Hoesch & Sohne GmbH & Co.: *See—*
Schotten, Alfons; Spolgen, Herman J.; and Rilling, Ulrich, 4,289,618, Cl. 210-142.000.
Schotten, Alfons, 4,289,622, Cl. 210-225.000.

Ebert, Robert W., to Marathon Electric Manufacturing Corp. Strain relief grommet in combination with a cord set extending from an electric motor. 4,289,923, Cl. 174-65.00G.

Economy, James; Lyerla, James R.; and Pederson, Lester A., to International Business Machines Corporation. Process for forming microcircuits. 4,289,573, Cl. 156-643.000.

Edgell, Thomas A.; Foote, Alfred R.; and Steele, Charles P., to Edgell, Thomas A.; Tillinghast, Roberta K.; and Fair, James W., a part interest. Earth fracturing apparatus. 4,289,072, Cl. 102-318.000.

Edwards, William M.: *See—*
Haren, Doyle V.; and Edwards, William M., 4,289,555, Cl. 156-149.000.

Edwin Burgess Limited: *See—*
Thomas, Stephen, 4,289,958, Cl. 235-489.000.

Efimenko, Sergei P.: *See—*
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.

Egan, William J.: *See—*
Carroll, Robert G.; Caporini, John I.; and Egan, William J., 4,290,031, Cl. 331-94.50G.

Egly, Robert A. Magnetic cassette storage case. 4,289,235, Cl. 206-387.000.

Ehemann, Horst; and Ruf, Max, to Audi NSU Auto Union. Outlet valve for a gas compressor. 4,289,159, Cl. 137-454.400.

Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Capacitive touch entry apparatus having high degree of personal safety. 4,290,052, Cl. 340-365.00C.

Eichenbaum, Bernard R.; and Topolski, Francis J., to Western Electric Company, Inc.; and Bell Telephone Laboratories. Methods of and apparatus for organizing fiber lightguides into a planar array. 4,289,558, Cl. 156-179.000.

Einwiller, Andreas: *See—*
Czauderna, Bernhard; Einwiller, Andreas; and Bott, Kaspar, 4,289,676, Cl. 260-29.60H.

Eistrat, Thomas. Dulled conductor and making same. 4,288,974, Cl. 57-223.000.

Ekman Engineering AG: *See—*
Ekman, Kjell R., 4,289,164, Cl. 137-614.030.

Ekman, Kjell R., to Ekman Engineering AG. Coupling device. 4,289,164, Cl. 137-614.030.

Ekstrom, Stig O. M. Reinforced bitumen pipes and process for their manufacture. 4,289,172, Cl. 138-149.000.

Electric Power Research Institute, Inc.: *See—*
Geil, Fred G.; and Thompson, John H., 4,290,035, Cl. 333-186.000.

Electro-Catheter Corporation: *See—*
Bernstein, Robert I., 4,289,134, Cl. 128-419.0PG.

Electrochem International, Inc.: *See—*
Grenda, David W., 4,289,597, Cl. 204-180.00R.

Electrospace Systems, Inc.: *See—*
Fenwick, Richard C., 4,290,071, Cl. 343-819.000.

Eli Lilly and Company: *See—*
Balko, Terry W.; and Hackler, Ronald E., 4,289,766, Cl. 424-246.000.
Balko, Terry W., 4,289,778, Cl. 424-263.000.
Chou, Ta-Sen, 4,289,695, Cl. 260-239.00A.
Debono, Manuel, 4,289,692, Cl. 260-112.50R.
DeLong, Donald C., 4,289,773, Cl. 424-250.000.
Molloy, Bryan B.; and Steinberg, Mitchell I., 4,289,787, Cl. 424-329.000.
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Sansregret, Joseph L., 4,289,602, Cl. 204-32.00S.
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Radigan, Steven J.; and Berry, Robert L., 4,289,574, Cl. 156-643.000.
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Ganz Brothers, Inc.: *See—*
Ganz, Robert H.; and Myers, John H., 4,289,236, Cl. 206-432.000.

Ganz, Robert H.; and Myers, John H., to Ganz Brothers, Inc. Case can package and method of forming same. 4,289,236, Cl. 206-432.000.

Garlock Inc: *See—*
Cather, Douglas A., Jr., 4,289,321, Cl. 277-152.000.

Garlock Inc.: *See—*
Cather, Douglas A., Jr.; and Benjamin, Martin E., 4,289,318, Cl. 277-12.000.

Gartner, Rodney W.; Gray, Charles R.; and Hazen, John O., to H. H. Robertson Company. Electrical activating assembly and closure member therefor. 4,289,921, Cl. 174-48.000.

Garvin, Hugh L.; and Pinnow, Douglas A., to Hughes Aircraft Company. High selectivity thin film polarizer. 4,289,381, Cl. 350-320.000.

Gary, Norman E.; and Lorenzen, Kenneth, to University of California, The Regents of the. Bee vacuum device and method of handling bees. 4,288,880, Cl. 6-12.00R.

Gasser, Rene, to Maschinenfabrik Ad. Schulthess & Co. Aktiengesellschaft. Ironing mangle. 4,288,934, Cl. 38-44.000.

Gatehouse, Diana M.: *See—*
Worthington, Paul A.; de Fraine, Paul; Rathmell, William G.; and Gatehouse, Diana M., 4,289,526, Cl. 71-92.000.

Gates, Kenneth L.: *See—*
Johnson, Larry K.; and Gates, Kenneth L., 4,288,887, Cl. 16-105.000.

Gauntt, Sibbley P.: *See—*
Csaky, Thomas J.; Gauntt, Sibbley P.; and Heard, Ralph L., Jr., 4,288,977, Cl. 57-297.000.

Gautschi, Fritz: *See—*
Schulte-Elte, Karl-Heinrich; Willhalm, Bruno; and Gautschi, Fritz, 4,289,659, Cl. 252-522.00R.

Gay, Charles H., Jr.: *See—*
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Gearhart Industries, Inc.: *See—*
Basham, Edward R.; and Mosely, L. Max, 4,289,024, Cl. 73-151.000.

Geil, Fred G.; and Thompson, John H., to Electric Power Research Institute, Inc. Mechanical filter and method of acoustically coupling waveguides therein. 4,290,035, Cl. 333-186.000.

Geluk, Ronald J.: *See—*
Baumann, Jacob S.; and Geluk, Ronald J., 4,290,112, Cl. 364-822.000.

General Binding Corporation: *See—*
Wiermanski, Jerome J., 4,289,330, Cl. 281-21.00R.

General DataComm Industries, Inc.: *See—*
Walsh, Dale M., 4,290,139, Cl. 375-14.000.

General Electric Company: *See—*
Anderson, Roy E.; Frey, Richard L.; and Lewis, James R., 4,290,141, Cl. 455-2.000.
Brown, Edgar D., Jr., 4,289,891, Cl. 556-453.000.
Cannon, John W., 4,289,941, Cl. 200-146.00R.
Corrigan, Francis R., 4,289,503, Cl. 51-307.000.
Davidson, Craig R.; and Sedlak, John M., 4,289,591, Cl. 204-129.000.
Dempsey, Russell M.; Coker, Thomas G.; La Conti, Anthony B.; and Fragala, Anthony R., 4,289,590, Cl. 204-98.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,290,052, Cl. 340-365.00C.
Espelage, Paul M., 4,290,001, Cl. 318-811.000.
Grimm, Bernard J.; and Dossett, Richard A., 4,288,995, Cl. 62-382.000.
Hysell, Robert E.; and Kalkbrenner, Francis W., 4,290,080, Cl. 357-81.000.
McFadyen, Robert J.; and Zeigler, John F., III, 4,290,126, Cl. 367-93.000.
Parks, Earl L.; and Zaidel, Simon A., 4,289,846, Cl. 430-314.000.
Puckette, Charles M., 4,290,022, Cl. 328-55.000.
Sarvas, Walter P., 4,289,799, Cl. 427-65.000.
Serrano, Juan de J., 4,290,061, Cl. 340-712.000.
Sterman, Albert P.; Gay, Charles H., Jr.; Tegarden, Frederick W.; and Lenahan, Dean T., 4,289,447, Cl. 415-200.000.
Wales, Wayne F.; and Frawley, James J., 4,289,803, Cl. 427-134.000.
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General Electric Company Limited, The: *See—*
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General Foods Corporation: *See—*
Kleiner, Fredric; Roy, Pradip K.; and Kuchman, Michael J., 4,289,794, Cl. 426-660.000.

General Foods France S.A.: *See—*
Bruelle, Georges, 4,289,790, Cl. 426-93.000.

General Mills, Inc.: *See—*
Johnston, Michael L.; Gordon, Loren J.; and Weinauer, Dietrich E., 4,289,470, Cl. 425-336.000.

General Motors Corporation: *See—*
Micheli, Adolph L., 4,289,802, Cl. 427-125.000.
Pearce, Warren, Jr.; Schramme, Stephan H.; Lightner, John L.; and McGee, Joseph A., 4,289,924, Cl. 174-152.00G.
Tranbarger, Glen E., 4,289,722, Cl. 264-102.000.

General Signal Corporation: *See—*
Parker, John W., 4,290,027, Cl. 330-293.000.

General Tire & Rubber Company, The: *See—*
Neubert, Terry C., 4,289,683, Cl. 260-38.000.

GenRad, Inc.: *See—*
Thiel, David W., 4,290,013, Cl. 324-73.0PC.

George, Robert D.; and Gray, Robert C., to Mechaneer, Inc. Apparatus for winding armatures. 4,289,281, Cl. 242-7.05B.

Gernlein, Hermann: *See—*
Reim, Werner; Gernlein, Hermann; and Zimmermann, Helmuth, 4,289,228, Cl. 198-339.000.

Gervay, Joseph E.: *See—*
Cohen, Abraham B.; and Gervay, Joseph E., 4,289,841, Cl. 430-253.000.

Geyer, Charles J., Jr.; and White, Ben E., to Fiber Associates, Incorporated. Process for continuous filtration and aging of xanthated alkali cellulose. 4,289,875, Cl. 536-60.000.

GFA-Gesellschaft fur Flachenabdichtung mit beschrankter Haftung: *See—*
Hammer, Heiner I., 4,289,552, Cl. 156-73.400.

Giacomelli, Enzo: *See—*
Traversari, Alessandro; and Giacomelli, Enzo, 4,289,322, Cl. 277-188.00A.

Gillette Company, The: *See—*
Douglass, Paul W.; and Trotta, Robert A., 4,288,920, Cl. 30-47.000.
Langlois, James L., 4,289,408, Cl. 366-76.000.

Gilman, Byron L., to Medtronic, Inc. A-V Sidearm lead. 4,289,144, Cl. 128-785.000.

Girling Limited: *See—*
Dufft, Jurgen; and Brearley, Malcolm, 4,289,358, Cl. 303-22.00R.

Glacier Metal Company, Limited, The: *See—*
Campbell, Brian D., 4,288,895, Cl. 29-149.50C.

Gladrow, Elroy M.; and Winter, William E., to Exxon Research & Engineering Co. Hydrocarbon cracking with mixture of zeolites Y and ZSM-5. 4,289,606, Cl. 208-120.000.

Glander, Fritz; and Voigt, Hermann U., to Kabel- und Metallwerke Gutehoffnungshutte AG. Grafting of silane on thermoplastics or elastomers for purposes of cross linking. 4,289,860, Cl. 525-263.000.

Glaser, Edward L.: *See—*
Pitt, Paul E.; Glaser, Edward L.; and Galie, Louis M., 4,290,115, Cl. 364-900.000.

Gleason, Joseph P., to Sullivan, Thomas P., a part interest. Position transducing method and means. 4,290,065, Cl. 340-870.430.

Gleaves, Donald; and Green, Walter. Aircraft fuel tester. 4,289,027, Cl. 73-299.000.

Glenn, E. Myles, to Upjohn Company, The. Method for treating inflammation. 4,289,757, Cl. 424-120.000.
Gless, Richard D.: *See*—
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,289,882, Cl. 546-141.000.
Gloucester Engineering Co., Inc.: *See*—
Keim, Karl H., 4,289,469, Cl. 425-302.100.
Gneth, Zoltan: *See*—
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth, Zoltan, 4,289,894, Cl. 560-82.000.
Goda, Tomoko: *See*—
Usami, Akira; Uebayashi, Toshiaki; Sato, Koji; and Goda, Tomoko, 4,289,130, Cl. 128-287.000.
Goddard, Donald L., to Babcock & Wilcox Company, The. Retractable storage lug. 4,289,291, Cl. 248-293.000.
Goeth, Hanns: *See*—
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,289,775, Cl. 424-251.000.
Goettl, Adam D. Automatic flushing and draining reservoir apparatus for evaporative coolers. 4,289,713, Cl. 261-27.000.
Goeuriot, Patrice M. V.: *See*—
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,289,545, Cl. 148-6.300.
Golczewski, Roman; Seach, Barry G.; and Cohen, Solomon E. Apparatus for extracting solids from slurry. 4,289,624, Cl. 210-404.000.
Gold King Mfg. Co.: *See*—
Rose, Bobby H., 4,289,355, Cl. 299-9.000.
Golda, Eugene: *See*—
Rowe, William; and Golda, Eugene, 4,289,838, Cl. 430-163.000.
Goldblatt Tool Company: *See*—
Robinson, David M., 4,289,215, Cl. 182-92.000.
Goldstein, Gideon: *See*—
Heavner, George; Tjoeng, Foe-Siong; and Goldstein, Gideon, 4,289,759, Cl. 424-177.000.
Gomez, I. Luis; and Cole, Robert, to Monsanto Company. Glass fiber bonding resins. 4,289,664, Cl. 260-19.00R.
Goodman, Richard M.; and Lim, Sim K., to American Cyanamid Company. Low molecular weight hydrolyzed polymers or copolymers as depressants in mineral ore flotation. 4,289,613, Cl. 209-167.000.
Gordon, Loren J.: *See*—
Johnston, Michael L.; Gordon, Loren J.; and Weinauer, Dietrich E., 4,289,470, Cl. 425-336.000.
Gordon, Roy G. Synthesis of chloromethyldisilanes. 4,289,890, Cl. 556-430.000.
Gotoh, Masahito: *See*—
Sato, Atsushi; Shimizu, Isoo; and Gotoh, Masahito, 4,289,918, Cl. 585-422.000.
Gould Inc.: *See*—
Piotti, Peter B., 4,290,002, Cl. 320-20.000.
Graf, Gary F.: *See*—
Dyroff, David R.; Graf, Gary F.; Kim, Keun Y.; and Suchanek, Walton F., Jr., 4,289,753, Cl. 424-48.000.
Graham, Kenneth W.: *See*—
Norton, Edward J.; and Graham, Kenneth W., 4,288,929, Cl. 36-69.000.
Graham Magnetics, Inc.: *See*—
Deffeyes, Robert J.; and Armstrong, Harris W., 4,289,534, Cl. 106-1.140.
Graham, Teresita O.: *See*—
Parsen, Frank E.; and Graham, Teresita O., 4,288,913, Cl. 29-623.500.
Granda, Edward J.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,289,145, Cl. 131-276.000.
Gransberry, N. Keith; and Haggerty, Allen C., to Boeing Company, The. Wire routing apparatus. 4,289,288, Cl. 248-56.000.
Gray, Charles R.: *See*—
Gartner, Rodney W.; Gray, Charles R.; and Hazen, John O., 4,289,921, Cl. 174-48.000.
Gray, Kenneth L.: *See*—
Dunbar, John H.; and Gray, Kenneth L., 4,289,471, Cl. 425-373.000.
Gray, Lorin S., III; Mattor, John A.; Millard, Ben; and Ward, Franklin J., to Scott Paper Company. Surface replication on a coated substrate. 4,289,821, Cl. 428-172.000.
Gray, Robert C.: *See*—
George, Robert D.; and Gray, Robert C., 4,289,281, Cl. 242-7.05B.
Gray, Thomas J., to Olin Corporation. Cathode for chlor-alkali cells. 4,289,650, Cl. 252-425.300.
Green, Albert R.: *See*—
Davis, Marvin L.; Davis, Edd C.; and Green, Albert R., 4,289,420, Cl. 404-35.000.
Green, Walter: *See*—
Gleaves, Donald; and Green, Walter, 4,289,027, Cl. 73-299.000.
Greenberg, Melvin: *See*—
Supcoe, Robert F.; and Greenberg, Melvin, 4,289,677, Cl. 260-33.6SB.
Greene, William C. Van top conversion and boat combination. 4,289,348, Cl. 296-157.000.
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., to Hanover Research Corporation. Process and apparatus for recovering clean water and solids from aqueous solids. 4,289,578, Cl. 159-47.0WL.
Greenfield, George, to Sangamo Weston, Inc. Voltage offset circuit for auto-zero low voltage amplifier. 4,290,023, Cl. 330-9.000.
Greenstadt, Joseph C.: *See*—
Frankhouser, Douglas L.; Schnitz, Louis; and Greenstadt, Joseph C., 4,289,244, Cl. 211-117.000.
Greer Hydraulics, Incorporated: *See*—
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Gregor, Lawrence V.: *See*—
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., 4,290,079, Cl. 357-71.000.
Gregorius, Klaus: *See*—
Janner, Karl; Gregorius, Klaus; and Muller, Reinhold, 4,289,592, Cl. 204-157.10R.
Greiler, Wolfgang: *See*—
Block, Werner; Pilsak, Manfred; Dusedau, Klaus; and Greiler, Wolfgang, 4,290,097, Cl. 362-264.000.
Grenda, David W., to Electrochem International, Inc. Process for electrodialytically regenerating an electroless plating bath by removing at least a portion of the reacted products. 4,289,597, Cl. 204-180.00R.
Gretler, Heinrich, to Bauer Kaba AG Sicherheits-Schliessyteme. Key for a cylinder lock and method for making same. 4,289,002, Cl. 70-358.000.
Greve, Wilfried; von Schuh, Heinzgeorg; and Anagnostopulos, Hiristo, to Hoechst Aktiengesellschaft. 4-Aminopyridines and medicaments containing the same. 4,289,765, Cl. 424-246.000.
Grib, William P.: *See*—
Latowski, Anthony A.; and Grib, William P., 4,289,485, Cl. 432-245.000.
Griebeler, Elmer L., to C-R-O, Inc. Narrow gap welding apparatus. 4,289,950, Cl. 219-124.340.
Grieve, Robin L.: *See*—
Bauer, John R.; Byars, Robert W.; and Grieve, Robin L., 4,289,732, Cl. 422-224.000.
Grimaud, Edouard: *See*—
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Grimm, Bernard J.; and Dossett, Richard A., to General Electric Company. Household refrigerator movable storage assembly. 4,288,995, Cl. 62-382.000.
Grollier, Jean-Francois: *See*—
Bugaut, Andree; Grollier, Jean-Francois; and Vandenboosche, Jean-Jacques, 4,289,495, Cl. 8-406.000.
Grosewald, Peter S.: *See*—
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., 4,290,079, Cl. 357-71.000.
Gruetsmacher, Gordon D.; and Stephens, Charles R., to Pfizer Inc. Preparation of erythorbic acid and ascorbis acid 6-fatty acid esters. 4,289,702, Cl. 260-343.700.
Grullmeier, Artur, to Rapp, Eugen; and Haug, Paul. Pneumo-hydraulic booster with rapid-traverse feature. 4,288,987, Cl. 60-560.000.
Grummett, Lorne H.: *See*—
Melissa, Raymond F.; Grummett, Lorne H.; and Fischer, Joseph J., 4,289,069, Cl. 101-93.010.
GTE Laboratories Incorporated: *See*—
Arumugham, Rangaswamy, 4,290,005, Cl. 323-313.000.
GTE Products Corporation: *See*—
Fishinger, Lawrence W., 4,289,415, Cl. 403-104.000.
Schreurs, Willy P., 4,289,991, Cl. 313-489.000.
Gubaidulin, Vyacheslav F.: *See*—
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.
Guenon, Jean-Pierre: *See*—
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Guettel, Marvin A.: *See*—
Jurek, Dennis J.; Guettel, Marvin A.; and Aslin, Michael, 4,289,948, Cl. 219-110.000.
Guidry, Joseph L. Body puller. 4,289,017, Cl. 72-462.000.
Gulf Oil Corporation: *See*—
Hedrich, Loren W., 4,289,527, Cl. 71-96.000.
Hill, Robert W.; Kehl, William L.; and Lynch, Thomas J., 4,289,863, Cl. 526-106.000.
Lakshmanan, Pallavoor R., 4,289,669, Cl. 260-27.0EV.
Gulf & Western Manufacturing Company: *See*—
Muzzell, Stephen E., 4,289,304, Cl. 267-112.000.
Gundlach, Robert W., to Xerox Corporation. Development method and apparatus. 4,289,837, Cl. 430-39.000.
Gunji, Koki; and Dan, Takehiro, to National Research Institute for Metals. Deoxidizing alloy for molten steel. 4,289,533, Cl. 75-138.000.
Gustafson, Leon D.; and Mielke, Wayne C., to Land O'Lakes, Inc. Method of making cheese. 4,289,793, Cl. 426-491.000.
Gustafson, Ralph A.: *See*—
Long, Lennart E.; Steele, Roger K.; Coleman, David F.; and Gustafson, Ralph A., 4,288,926, Cl. 33-174.00P.
Gyro Mining Transport Limited: *See*—
Hudson, Richard C.; and Howarth, Andrew W., 4,289,274, Cl. 238-249.000.

H. H. Robertson Company: *See*—
Gartner, Rodney W.; Gray, Charles R.; and Hazen, John O., 4,289,921, Cl. 174-48.000.

H. K. Porter, Inc.: *See*—
Porter, Thomas M., 4,289,015, Cl. 72-384.000.

Haberland, Ulrich: *See*—
Friederich, Klaus; Heinze, Gerhard; Reiff, Helmut; Michael, Dietrich; Schon, Manfred; Markusch, Peter; Haberland, Ulrich; Dieterich, Dieter; and Merten, Josef, 4,289,672, Cl. 260-29.2TN.

Habock, Adolf: *See*—
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Hachisuka, Takeji, to Kabushiki Kaisha Fujikoshi t/a Nachi-Fujikoshi Corp. Liquid phase sintered dense composite body for brazed joints and method for making the same. 4,289,833, Cl. 428-544.000.

Hacias, Kenneth J., to Hooker Chemicals & Plastics Corp. Aqueous acidic lubricant composition and method for coating metals. 4,289,546, Cl. 148-6.15R.

Hackler, Ronald E.: *See*—
Balko, Terry W.; and Hackler, Ronald E., 4,289,766, Cl. 424-246.000.

Hafner, Franz: *See*—
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Haggerty, Allen C.: *See*—
Gransberry, N. Keith; and Haggerty, Allen C., 4,289,288, Cl. 248-56.000.

Haggerty, John S., to Massachusetts Institute of Technology. Process for controlling powder size with optical energy. 4,289,952, Cl. 219-121.00L.

Hagiwara, Miyuki; and Morita, Yosuke, to Japan Atomic Energy Research Institute. Fire retardant resin molded product and preparation process of the same. 4,289,687, Cl. 260-45.85E.

Haines, Harold R., to United States of America, Army. Clog-proof check valve. 4,289,166, Cl. 137-846.000.

Haker, Rolf; Fuhrer, Heinz-Georg; van Rijckevorsel, Rainer; Ruhl, Werner; and Thiery, Joachim, to Labora Mannheim GmbH fur Labortechnik. Minicomputer. 4,290,113, Cl. 364-900.000.

Hall, John B.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,289,145, Cl. 131-276.000.

Hall, John N., to Hercules Incorporated. Reticulated web making apparatus. 4,289,464, Cl. 425-66.000.

Hallack, Richard D.; and Carter, Tommie B. Apparatus for removing suspended solids from an effluent. 4,289,616, Cl. 210-101.000.

Hallengren, Charles R., to Illinois Tool Works Inc. Apparatus for producing threaded self-tapping stainless steel screws. 4,289,006, Cl. 72-38.000.

Haller, Ingo: *See*—
Sasse, Klaus; Haller, Ingo; Plempel, Manfred; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,289,771, Cl. 424-249.000.

Halliburton Company: *See*—
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Hallman, Robert W.; Kimoto, Koichi; and Okai, Sakuo, to Napp Systems (USA), Inc. Shallow relief non-bottoming photopolymer printing plate. 4,289,071, Cl. 101-395.000.

Haluko, Michael, Jr., to Kinematics, Inc. Linear motion device. 4,289,040, Cl. 74-50.000.

Halvorsen, Kenneth, to Medical Testing Systems, Inc. Electrode assembly for temporary pacing and heart measurements. 4,289,138, Cl. 128-642.000.

Ham, Allan L.: *See*—
Campbell, Simon F.; Danilewicz, John C.; Evans, Anthony G.; and Ham, Allan L., 4,289,772, Cl. 424-250.000.

Hamaker, Raymond W.: *See*—
Alcorn, George E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,289,834, Cl. 428-601.000.

Hamm, Wilfried. Hand-rail element for staircase. 4,289,303, Cl. 256-69.000.

Hammer, Heiner I., to GFA-Gesellschaft fur Flachenabdichtung mit beschrankter Haftung. Method for the continuous welding of thermoplastic sheets. 4,289,552, Cl. 156-73.400.

Hammond, Howard A.; and Whitcomb, Paul H., to Eaton Corporation. Tree processing apparatus. 4,289,177, Cl. 144-2.00Z.

Hampshire, Michael J., to Ward & Goldstone Limited. Multiplex information handling system. 4,290,134, Cl. 370-92.000.

Hanaford, Donald E.; and Oldham, Dale R., to Thomson, Arthur E. Stranding apparatus. 4,289,564, Cl. 156-425.000.

Hanak, Gyula, to PB Gelatines. Press for rendering fatty bones. 4,289,067, Cl. 100-117.000.

Hanover Research Corporation: *See*—
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 4,289,578, Cl. 159-47.0WL.

Hansen, Arne H., to Meyertech Incorporated. Fitting with tangential locking rod for coupling pipes. 4,289,339, Cl. 285-305.000.

Hansen, Glen D., to Veda, Inc. Silo unloader lowering control. 4,289,437, Cl. 414-315.000.

Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., to United States of America, Navy. Method and apparatus for detecting subterranean anomalies by generating two parallel magnetic fields. 4,290,020, Cl. 324-334.000.

Hanson, James A.; and Kopp, Manfred K., to United States of America, Energy. Multianode cylindrical proportional counter for high count rates. 4,289,967, Cl. 250-385.000.

Hansson, Bengt O., to Aktiebolaget Sundsvalls Specialprodukter. Vehicle carried manure removing machine. 4,289,439, Cl. 414-523.000.

Hanz, Marvin C.: *See*—
Elkins, Johnny C.; and Hanz, Marvin C., 4,289,432, Cl. 408-201.000.

Hara, Shoji. High pressure glass column for high performance liquid chromatography. 4,289,620, Cl. 210-198.200.

Harders, Hans-Dieter; and Helger, Roland, to Merck Patent Gesellschaft mit beschrankter Haftung. Aqueous lipid standard solution. 4,289,649, Cl. 252-408.000.

Hardison, Leslie C.; Eng, Joseph P.; and Nagl, Gary J., to Air Resources, Inc. Solvent recovery from water. 4,289,505, Cl. 55-59.000.

Hare, Charles E. Automobile frame alignment apparatus. 4,289,016, Cl. 72-457.000.

Haren, Doyle V.; and Edwards, William M., to Dayco Corporation. Method of making polymeric hose. 4,289,555, Cl. 156-149.000.

Harper, Clarence E.; and Elliott, William J., to Quietlite International, Ltd. Direct current power source for an electric discharge lamp. 4,289,993, Cl. 315-311.000.

Harri, Eugen: *See*—
Traber, Rene P.; Kuhn, Max; Hofmann, Hans; and Harri, Eugen, 4,289,851, Cl. 435-71.000.

Harris Corporation: *See*—
Ports, Kenneth A., 4,288,911, Cl. 29-574.000.

Harris, Curtis C.; Yolken, Robert; and Hsu, Ih-Chang, to United States of America, America. Ultrasensitive enzymatic radioimmunoassay method. 4,289,748, Cl. 424-1.000.

Harris Data Communications, Inc.: *See*—
Traster, Elden D., 4,290,063, Cl. 340-723.000.
Traster, Elden D., 4,290,064, Cl. 340-723.000.

Harris, Marvin E., Jr.; and Thigpen, Hubert H., to Celanese Corporation. Stabilization of liquid paraformaldehyde. 4,289,912, Cl. 568-422.000.

Harris, Ronald J., to Sterling Merchandise Co. Retail store. 4,288,948, Cl. 52-28.000.

Harshberger, Robert P., Jr., to Ampex Corporation. Digital variable voltage level control circuit with automatic return to neutral. 4,289,999, Cl. 318-341.000.

Hartley, E. Dale: *See*—
Feightner, L. Clark; and Hartley, E. Dale, 4,290,040, Cl. 335-274.000.

Hasegawa, Taiji: *See*—
Suda, Seiji; Hasegawa, Taiji; Mouri, Yasunori; and Furuhashi, Toshio, 4,290,107, Cl. 364-431.000.

Hasizume, Masaharu: *See*—
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, 4,289,194, Cl. 164-170.000.

Hasulak, Joseph. Merchandise display stand. 4,289,245, Cl. 211-133.000.

Hatfield, John G., to AMP Incorporated. Cable clamping and orienting apparatus. 4,288,908, Cl. 29-564.100.

Hathaway, Dana B., to Epicure Products, Inc. Loudspeaker and enclosure combination. 4,289,929, Cl. 179-1.00E.

Hattori, Akira, to Fujitsu Limited. System and method for achieving buffer memory coincidence in a multiprocessor system. 4,290,103, Cl. 364-200.000.

Hattori, Yasuhiro: *See*—
Munekata, Kenichi; Fujita, Michio; and Hattori, Yasuhiro, 4,288,945, Cl. 51-238.00S.

Haug, Paul: *See*—
Grullmeier, Artur, 4,288,987, Cl. 60-560.000.

Hawkes, Peter C., to Andrews MacLaren Limited. Collapsible tripods. 4,289,326, Cl. 280-646.000.

Hayakawa, Masanori; and Nishimura, Satoshi, to Central Glass Company, Limited. Process for preparation of micaceous iron oxide. 4,289,746, Cl. 423-633.000.

Hayashi, Josaburo: *See*—
Yajima, Seishi; Shishido, Toetsu; Okamura, Kiyohito; Kayano, Hideo; Hayashi, Josaburo; and Kobayashi, Hiroshi, 4,289,720, Cl. 264-63.000.

Hayes, William V.; and Childress, David L., to Dow Chemical Company, The. Catalyst for the preparation of ethylenimine. 4,289,656, Cl. 252-470.000.

Haynes, Paul L., Jr.: *See*—
Noell, Godwin L.; and Haynes, Paul L., Jr., 4,289,460, Cl. 418-78.000.

Hayssen Manufacturing Company: *See*—
James, Robert C., 4,288,965, Cl. 53-451.000.

Hazen, John O.: *See*—
Gartner, Rodney W.; Gray, Charles R.; and Hazen, John O., 4,289,921, Cl. 174-48.000.

Hazen Research, Inc.: *See*—
Kindig, James K.; and Turner, Ronald L., 4,289,528, Cl. 75-1.00R.
Kindig, James K.; and Turner, Ronald L., 4,289,529, Cl. 75-1.00R.

Heard, Ralph L., Jr.: *See*—
Csaky, Thomas J.; Gauntt, Sibbley P.; and Heard, Ralph L., Jr., 4,288,977, Cl. 57-297.000.

Heavner, George; Tjoeng, Foe-Siong; and Goldstein, Gideon, to Ortho Pharmaceutical Corporation. Immunoregulatory diketopiperazine compounds. 4,289,759, Cl. 424-177.000.

Heck, Friedrich. Insulating-slabs and their use. 4,288,956, Cl. 52-309.120.

Hedrich, Loren W., to Gulf Oil Corporation. Plant growth regulating perfluoroacyl arylthioureido isoindolediones. 4,289,527, Cl. 71-96.000.

Hedrich, Winfried, to Rahdener Maschinenfabrik August Kolbus GmbH & Co. KG. Apparatus for applying an overlay to a substrate. 4,289,493, Cl. 493-389.000.

Heeren, Richard H., to Teletype Corporation. Method of manufacturing a semiconductor device. 4,288,910, Cl. 29-571.000.

Heibel, Helmut, to Lucas Industries Limited. Friction pad assemblies for disc brakes. 4,289,217, Cl. 188-73.380.

Heil-Quaker Corporation: *See*—
Tomlinson, Ronald S., 4,289,730, Cl. 422-178.000.

Heimbigner, Donald L. Finger grip insert for a bowling ball. 4,289,312, Cl. 273-63.00A.

Heinrich-Hertz-Institut fur Nachrichtentechnik Berlin GmbH: *See*—
Schnee, Rolf; Kraus, Franz; Kiel, Friedrich; Kliem, Helmut; Krick, Wolfgang; and Landgraf, Herbert, 4,290,142, Cl. 455-3.000.

Heinrich, Richard J. Dump compactor for refuse. 4,289,068, Cl. 100-215.000.

Heinrich Wunder KG: *See*—
Zoor, Reinhold, 4,289,260, Cl. 224-315.000.

Heinze, Gerhard: *See*—
Friederich, Klaus; Heinze, Gerhard; Reiff, Helmut; Michael, Dietrich; Schon, Manfred; Markusch, Peter; Haberland, Ulrich; Dieterich, Dieter; and Merten, Josef, 4,289,672, Cl. 260-29.2TN.

Helbig, Joachim W.: *See*—
Kopp, Klaus F.; and Helbig, Joachim W., 4,289,750, Cl. 424-33.000.

Held, John F.: *See*—
Bucher, John H.; Butler, John F.; and Held, John F., 4,289,548, Cl. 148-12.00B.

Helft, John M.: *See*—
Noyes, Walter O.; and Helft, John M., 4,290,059, Cl. 340-624.000.

Helger, Roland: *See*—
Harders, Hans-Dieter; and Helger, Roland, 4,289,649, Cl. 252-408.000.

Hellouin de Menibus, Olivier, to AMS, S.A. Method and apparatus for measuring degasification. 4,289,018, Cl. 73-19.000.

Hellouin di Cenival, Bruno: *See*—
Cadars, Patrick; and Hellouin di Cenival, Bruno, 4,289,507, Cl. 55-195.000.

Helmbreck, Andrew J., to Rogge, Russell C., a part interest. Painter's protective device. 4,288,878, Cl. 2-427.000.

Helms, Charles R., to Container Corporation of America. Hermetically sealed container. 4,289,252, Cl. 220-308.000.

Henderson, William D., to Otis Engineering Corporation. Well tubing coupling apparatus. 4,289,202, Cl. 166-212.000.

Henige, Joseph A.: *See*—
Sawyer, David H.; Henige, Joseph A.; and Rauchholz, Alvin W., 4,289,572, Cl. 156-617.0SP.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Schaper, Ulf-Armin; and Bruns, Klaus, 4,289,660, Cl. 252-522.00R.
Weber, Rudolf; and Andree, Hans, 4,289,642, Cl. 252-99.000.

Henry, James L., to Bell Telephone Laboratories, Incorporated. Dial pulse detection. 4,289,933, Cl. 179-18.0FA.

Henry Lindsay Limited: *See*—
Alderton, Gordon H. S., 4,289,059, Cl. 411-531.000.

Henzi, Beat, to Sandoz Ltd. Azo dyes having a quaternized heterocyclic diazo component radical and an optionally substituted aryloxyalkyl substituent on the amino group of the coupling component radical. 4,289,693, Cl. 260-146.00R.

Herb, Armin; Popp, Franz; and Ruoff, Hanspeter, to Hilti Aktiengesellschaft. Device for melting a solid body of adhesive material. 4,289,257, Cl. 222-146.0HE.

Hercules Incorporated: *See*—
Hall, John N., 4,289,464, Cl. 425-66.000.

Herdle, William B.; Kanner, Bernard; and Bailey, Donald L., to Union Carbide Corporation. Preparation of tetraalkoxysilanes. 4,289,889, Cl. 556-470.000.

Hergenhan, Odo, to Burroughs Corporation. N Phase digital inverter. 4,290,101, Cl. 363-65.000.

Herman, Richard M.: *See*—
Kolycheck, Edmond G.; and Herman, Richard M., 4,289,825, Cl. 428-407.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Anders, Dietmar, 4,289,410, Cl. 366-88.000.
Brand, Wilhelm, 4,289,409, Cl. 366-83.000.

Hernandez, Pablo M., to S. C. Johnson & Son, Inc. Coating composition for drawing and ironing steel containers. 4,289,671, Cl. 260-28.5AV.

Herndon, Marion E., Jr., to Conor Corporation. Internal loading cylindrical filter with unsupported tubular filter fabric. 4,289,510, Cl. 55-294.000.

Herold, Heiko; Herold, Richard; Klee, Rudolf J.; and Muschelknautz, Edgar, to Bayer Aktiengesellschaft. Method of cooling stuffer crimped yarn. 4,288,893, Cl. 28-266.000.

Herold, Richard: *See*—
Herold, Heiko; Herold, Richard; Klee, Rudolf J.; and Muschelknautz, Edgar, 4,288,893, Cl. 28-266.000.

Herolzer, Ralph H. Device for removing feathers from game fowl. 4,288,888, Cl. 17-11.10R.

Herrington, F. John, Jr., to Mobil Oil Corporation. Method for extrusion of tubular films. 4,289,727, Cl. 264-514.000.

Hetzel, Eckhard: *See*—
Koehler, Waldemar; Blumenberg, Bernd; Vogel, Ludwig; and Hetzel, Eckhard, 4,289,589, Cl. 203-49.000.

Heuer, Wolfgang: *See*—
Brand, Werner; Zavadil, Jaroslav; and Heuer, Wolfgang, 4,289,247, Cl. 213-20.000.

Hiatt, Carl C.; and Larson, Nils L. Structural building element. 4,288,955, Cl. 52-309.100.

Higashi, Ryozi: *See*—
Takaoka, Saburo; and Higashi, Ryozi, 4,289,928, Cl. 179-1.00D.

Higashiyama, Hirokichi: *See*—
Yoshiwara, Seishiro; and Higashiyama, Hirokichi, 4,289,011, Cl. 72-208.000.

Higgins, Edwin G., Jr.: *See*—
Zakiewicz, Bohdan M., 4,289,354, Cl. 299-4.000.

Hilker, Dennis C., to Honeywell Information Systems Inc. Apparatus and method of testing CML circuits. 4,290,137, Cl. 371-24.000.

Hill, James D.: *See*—
Cornelius, Rorger W.; Hill, James D.; and Quinn, Paul A., Jr., 4,289,411, Cl. 400-126.000.

Hill, Robert W.; Kehl, William L.; and Lynch, Thomas J., to Gulf Oil Corporation. Ethylene polymerization process. 4,289,863, Cl. 526-106.000.

Hilti Aktiengesellschaft: *See*—
Herb, Armin; Popp, Franz; and Ruoff, Hanspeter, 4,289,257, Cl. 222-146.0HE.
Schiefer, Erwin, 4,289,062, Cl. 411-34.000.

Hintermann, Rudolf; Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, to Voest-Alpine Aktiengesellschaft. Hollow cutting head. 4,289,357, Cl. 299-81.000.

Hiorns, Frederick J., to Associated Portland Cement Manufacturers Limited, The. Particulate matter air assisted screw discharge apparatus. 4,289,428, Cl. 406-39.000.

Hirai, Jun, to Sony Corporation. Noise and cross-talk elimination in recording and reproducing video signals. 4,290,082, Cl. 358-8.000.

Hiraide, Seiji: *See*—
Matsumoto, Masashige; Kobuna, Hideaki; Hiraide, Seiji; and Kawai, Kouichi, 4,289,575, Cl. 156-656.000.

Hirose, Yoshiharu: *See*—
Koga, Kenichiro; Hirose, Yoshiharu; Kanno, Iwao; Uemura, Kazuo; and Miura, Shuichi, 4,289,965, Cl. 250-363.00S.

Hirschberg, Kenneth A.: *See*—
Thompson, Tom; and Hirschberg, Kenneth A., 4,290,093, Cl. 362-98.000.

Hitachi, Ltd.: *See*—
Honda, Juichi; Matumoto, Michiaki; and Mimori, Sadao, 4,289,474, Cl. 431-10.000.
Masuda, Kouji; Mizukami, Masao; and Kitamura, Nobuaki, 4,290,119, Cl. 365-189.000.
Mizutani, Tatsumi; Ueki, Kazuyoshi; Iida, Shinya; and Komatsu, Hideo, 4,289,188, Cl. 156-626.000.
Nakamura, Ichiro, 4,289,063, Cl. 91-306.000.
Namba, Takamasa; Yanagawa, Hidekata; Fujimoto, Nobuo; Mori, Takehiko; and Yamada, Takayoshi, 4,289,263, Cl. 226-196.000.
Sanpei, Konomu; and Fujii, Tadaaki, 4,290,009, Cl. 324-57.00R.
Shimada, Toshikazu; Katayama, Yoshifumi; and Komatsubara, Kiichi F., 4,289,822, Cl. 428-212.000.
Suda, Seiji; Hasegawa, Taiji; Mouri, Yasunori; and Furuhashi, Toshio, 4,290,107, Cl. 364-431.000.
Sugie, Mamoru; Yamaguchi, Noboru; Mayama, Koichi; Kita, Yuzo; Yoshizawa, Shigeru; Saito, Nobuo; and Asano, Atsushi, 4,290,117, Cl. 365-15.000.

Hitachi Ome Electronic Co., Ltd.: *See*—
Masuda, Kouji; Mizukami, Masao; and Kitamura, Nobuaki, 4,290,119, Cl. 365-189.000.

Hitt, Mary M.: *See*—
Tolbert, William R.; Hitt, Mary M.; and Feder, Joseph, 4,289,854, Cl. 435-241.000.

HJH Chemicals, Inc.: *See*—
Blasius, James R., 4,289,662, Cl. 252-607.000.

Hobart Corporation: *See*—
Vallor, Ben J., 4,289,543, Cl. 134-25.200.

Hockswender, Thomas R.: *See*—
Christenson, Roger M.; Maska, Rudolf; Dowbenko, Rostyslawa; and Hockswender, Thomas R., 4,289,674, Cl. 260-29.6NR.

Hoechst Aktiengesellschaft: *See*—
Disselbeck, Dieter; Neumann, Gerhard; Ott, Karl-Heinz; Strobel, Gunther; and Zalewski, Edwin, 4,289,627, Cl. 210-702.000.
Disselbeck, Dieter; and Richter, Rudolf, 4,289,628, Cl. 210-703.000.
Greve, Wilfried; von Schuh, Heinzgeorg; and Anagnostopulos, Hiristo, 4,289,765, Cl. 424-246.000.
Mohler, Werner; Jayme, Manfred; and Komarek, Jaromir, 4,289,776, Cl. 424-253.000.
Neumann[illegible]gen, 4,289,026, Cl. 73-290.00R.
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Ritz, Jurgen; Hotze, Hermann; and Mummenthey, Hans-Dieter, 4,289,866, Cl. 526-320.000.

Hoehne, Peter: *See*—
Brunner, Heinrich; Drebinger, Peter; Hoehne, Peter; Hoisl, Johann; Kochanowski, Guenter; and Wimmer, Walter, 4,290,136, Cl. 371-25.000.

Hofferber, James A., to Phillips Petroleum Company. Fractional distillation column pumparound heat removal control. 4,289,588, Cl. 203-2.000.

Hoffman, Herbert A.: *See*—
Elston, Colin; Hoffman, Herbert A.; and Murphy, H. Joseph, 4,289,580, Cl. 162-109.000.

Hoffman, John G.: *See*—
Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., 4,290,020, Cl. 324-334.000.

Hoffmann, Christian: *See*—
Zollner, Manfred; Hoffmann, Christian; and Zwicker, Eberhard, 4,289,935, Cl. 179-107.0FD.

Hoffmann-La Roche Inc.: *See*—
Friesen, Heinz-Jurgen; and Pestka, Sidney, 4,289,689, Cl. 260-112.00R.
Pestka, Sidney; and Rubinstein, Menachem, 4,289,690, Cl. 260-112.00R.

Hoffmann, Ralph L., to Perfection Manufacturing Company, The. Work control assembly in an exerciser. 4,289,309, Cl. 272-73.000.

Hofmann, Hans: *See*—
Traber, Rene P.; Kuhn, Max; Hofmann, Hans; and Harri, Eugen, 4,289,851, Cl. 435-71.000.

Hoisl, Johann: *See*—
Brunner, Heinrich; Drebinger, Peter; Hoehne, Peter; Hoisl, Johann; Kochanowski, Guenter; and Wimmer, Walter, 4,290,136, Cl. 371-25.000.

Hoki, Tsuneo; Miura, Nobuo; and Watanabe, Hiroshi, to Asahi-Dow Limited. Foamable polymeric compositions. 4,289,857, Cl. 521-85.000.

Hold, Peter; and Tadmor, Zehev, to USM Corporation. Rotary seal construction and processor. 4,289,319, Cl. 277-59.000.

Holden, Homer N.: *See*—
Kleykamp, Donald L.; and Holden, Homer N., 4,289,077, Cl. 105-199.00C.

Holter, Heinz. Dust aspirating arrangement. 4,289,509, Cl. 55-257.0PV.

Holtey, Thomas O.; Miller, Robert C.; and Yu, Kin C., to Honeywell Information Systems Inc. Computer system having a paging apparatus for mapping virtual addresses to real addresses for a memory of a multiline communications controller. 4,290,104, Cl. 364-200.000.

Holzknecht, Walter. Method for preparing a plurality of labels. 4,289,561, Cl. 156-265.000.

Holzwarth, Robert W., to Model A and Model T Car Reproduction Corporation, The. Vehicle folding top. 4,289,347, Cl. 296-107.000.

Honda, Akira: *See*—
Ando, Ryo; Sato, Kazuyoshi; and Honda, Akira, 4,289,462, Cl. 425-8.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Okada, Motohiro, 4,289,327, Cl. 280-737.000.

Honda, Juichi; Matumoto, Michiaki; and Mimori, Sadao, to Hitachi, Ltd. Process of combusting a premixed combustion fuel. 4,289,474, Cl. 431-10.000.

Honda, Keisuke. Fish detector capable of detecting species of fish. 4,290,125, Cl. 367-87.000.

Honeywell Information Systems Inc.: *See*—
Hilker, Dennis C., 4,290,137, Cl. 371-24.000.
Holtey, Thomas O.; Miller, Robert C.; and Yu, Kin C., 4,290,104, Cl. 364-200.000.

Honnen, Lewis R.: *See*—
Lewis, Robert A.; and Honnen, Lewis R., 4,289,634, Cl. 252-32.500.

Hooker Chemicals & Plastics Corp.: *See*—
Emmett, John E., 4,289,060, Cl. 411-34.000.
Emmett, John E., 4,289,061, Cl. 411-34.000.
Hacias, Kenneth J., 4,289,546, Cl. 148-6.15R.
Howell, John K., Jr., 4,289,826, Cl. 428-418.000.
King, Peter F.; and Beyer, George J., 4,289,547, Cl. 148-6.15R.
Lazarz, Christine A.; Cook, Edward H., Jr.; and Scripa, Lesleigh V., 4,289,600, Cl. 204-296.000.

Hookway, Warren A., Jr.: *See*—
Marginean, Barry L.; and Hookway, Warren A., Jr., 4,289,535, Cl. 106-19.000.

Hooper, David C.; Johnson, George A.; and Peter, Donald, to Lever Brothers Company. Detergent product. 4,289,641, Cl. 252-96.000.

Hopkins, Michael F., to Caterpillar Tractor Co. Differential gear positioning means. 4,289,047, Cl. 74-713.000.

Hore, Donald L., to Rotork Limited. Fail-safe attachment for an actuator. 4,289,038, Cl. 74-2.000.

Hori, Shinichi: *See*—
Taniguchi, Koichi; Katayama, Minoru; Sangu, Osamu; and Hori, Shinichi, 4,290,109, Cl. 364-481.000.

Horigome, Eiji: *See*—
Ota, Hiroshi; Horigome, Eiji; and Azegami, Hitoshi, 4,289,828, Cl. 428-425.900.

Horizon Manufacturing Corporation: *See*—
Anderson, Eugene R., 4,289,744, Cl. 423-579.000.

Hornbaker, Edwin D.; and Li, Hsueh M., to Ethyl Corporation. Liquid phosphazene compositions. 4,289,862, Cl. 525-538.000.

Horstmann, Walter: *See*—
Imre, Laszlo; Horstmann, Walter; and Leopold, Hans-Gerhard, 4,289,881, Cl. 544-352.000.

Hoshino, Yoshikazu; and Shuto, Masayoshi, to Shionogi & Co., Ltd. Method and apparatus for discriminatively determining electrical constants. 4,290,008, Cl. 324-57.00R.

Hoskins, Michael K.; and Christiansen, Gary D., to Ortho Diagnostics, Inc. Blood gas controls composition, method and apparatus. 4,289,648, Cl. 252-408.000.

Hotta, Tetsuya; Enomoto, Satoru; Yoshikumi, Chikao; Ohara, Minoru; and Ueno, Saburo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Protein-bound polysaccharides. 4,289,688, Cl. 260-112.00R.

Hotz, Dieter: *See*—
Mahncke, Jurgen; Weigele, Hans; and Hotz, Dieter, 4,288,881, Cl. 14-2.400.

Hotze, Hermann: *See*—
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Houle, Conrad G.: *See*—
Specht, Donald P.; Houle, Conrad G.; and Farid, Samir Y., 4,289,844, Cl. 430-281.000.

Hovel, Harold J., to International Business Machines Corporation. Multiple bandgap solar cell on transparent substrate. 4,289,920, Cl. 136-246.000.

Hovey, Richard J., to American Optical Corporation. Gradient photochromic lens and method selectively reducing photochromic activity. 4,289,497, Cl. 8-506.000.

Howard, Terence R., to Coal Industry (Patents) Limited. Shield assemblies for installation in under-ground roadways and rock excavating machines including such shield assemblies. 4,289,356, Cl. 299-33.000.

Howarth, Andrew W.: *See*—
Hudson, Richard C.; and Howarth, Andrew W., 4,289,274, Cl. 238-249.000.

Howell, John K., Jr., to Hooker Chemicals & Plastics Corp. Waterborne coating for metal surfaces. 4,289,826, Cl. 428-418.000.

Hsu, Ih-Chang: *See*—
Harris, Curtis C.; Yolken, Robert; and Hsu, Ih-Chang, 4,289,748, Cl. 424-1.000.

Huang, Denis K., to Westvaco Corporation. Process for producing dry finished paperboard. 4,289,808, Cl. 427-209.000.

Huang, Yen T. Modular inflatable dome structure. 4,288,947, Cl. 52-2.000.

Hucks, Uwe: *See*—
Druschke, Frank; Margotte, Dieter; Tresper, Erhard; Bottenbruch, Ludwig; Cohnen, Wolfgang; and Hucks, Uwe, 4,289,685, Cl. 260-45.70S.

Hudec, Gustav; Keil, Karl-Heinz; Kohler, Volker; and Rosenbusch, Kurt, to Cassella Aktiengesellschaft. Process for the preparation of aqueous emulsions, stable in storage, of N.alkyl-N-alkylol-ureas and their application for the softening of leather. 4,289,665, Cl. 260-21.000.

Hudson, Richard C.; and Howarth, Andrew W., to Gyro Mining Transport Limited. Rail track. 4,289,274, Cl. 238-249.000.

Hudson, Robert H.: *See*—
Ptaszek, George W.; and Hudson, Robert H., 4,288,943, Cl. 46-227.000.

Hughes Aircraft Company: *See*—
Garvin, Hugh L.; and Pinnow, Douglas A., 4,289,381, Cl. 350-320.000.
Verma, Surendra, 4,288,916, Cl. 29-828.000.
Wang, Harry T., 4,290,030, Cl. 331-3.000.

Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth, Zoltan, to Chinoin Gyogyszer es Vegylszeti Termekek Gyara R.T. Pentachlorophenyl-phenyl malonate compound suitable for use as acylating agents. 4,289,894, Cl. 560-82.000.

Hung, John H., to International Paper Company. Polymeric sheets. 4,289,125, Cl. 128-156.000.

Hunke, Siegfried H., to Textron, Inc. Crown control for rolling mill. 4,289,013, Cl. 72-243.000.

Hunter, James B.; McGuire, George; D'Alessandro, A. F.; and Lawlor, Larry L., to Johnson Matthey Inc. Catalyst comprising a metal substrate. 4,289,652, Cl. 252-437.000.

Hutchings, Robert M.: *See*—
Acres, Gary J. K.; and Hutchings, Robert M., 4,289,737, Cl. 423-245.000.

Hutchison, James M. S.; Mallard, John R.; and Sutherland, Robert J., to National Research Development Corporation. Methods of deriving image information from objects. 4,290,019, Cl. 324-311.000.

Hydril Company: *See*—
Mott, James D., 4,289,205, Cl. 166-315.000.

Hysell, Robert E.; and Kalkbrenner, Francis W., to General Electric Company. Method of making a strain buffer for a semiconductor device. 4,290,080, Cl. 357-81.000.

I.T.I. Limited: *See*—
Mougin, Georges L., 4,289,423, Cl. 405-61.000.

Ichikawa, Mamoru: *See*—
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Seko, Kiyoshi; and Ichikawa, Mamoru, 4,288,967, Cl. 53-550.000.
Seko, Kiyoshi; and Ichikawa, Mamoru, 4,288,968, Cl. 53-550.000.

Iezuka, Isamu: *See*—
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Ihara Chemical Industry Co., Ltd.: *See*—
Nakayama, Yoshiki; Yazawa, Chihiro; and Yamanashi, Koji, 4,289,916, Cl. 570-209.000.

Iida, Shinya: *See*—
Mizutani, Tatsumi; Ueki, Kazuyoshi; Iida, Shinya; and Komatsu, Hideo, 4,289,188, Cl. 156-626.000.

Ikeda, Hideo; Tsuchiya, Hideshi; and Okada, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Speaker with fine grain ferromagnetic material on center pole or ring. 4,289,937, Cl. 179-119.00R.

Ikeda, Matujiro: *See*—
Inagawa, Takashi; Kushida, Naoto; Sekiguchi, Akira; Ikeda, Matujiro; Sugawara, Hidetoshi; and Naito, Kunio, 4,290,037, Cl. 335-202.000.

Ilardi, Joseph M.: *See*—
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Illinois Tool Works Inc.: *See*—
Hallengren, Charles R., 4,289,006, Cl. 72-38.000.

Illinois Water Treatment Company: *See*—
Bailey, James E.; and Cho, Yong K., 4,289,853, Cl. 435-177.000.

Imasu, Kenichiro: *See*—
Murase, Fujio; Matsumoto, Hidenosuke; Fujieda, Hiroshi; Takano, Teruhisa; and Imasu, Kenichiro, 4,289,272, Cl. 236-91.00D.

Immel, Erich A. Self-propelled battery powered cart for pushing disabled vehicles. 4,289,212, Cl. 180-19.00R.

Imperial Chemical Industries Limited: *See*—
Koronka, Paul, 4,289,081, Cl. 111-88.000.
Last, Anthony G. M., 4,289,831, Cl. 428-515.000.
Simons, Phillip R., 4,289,560, Cl. 156-244.180.

Worthington, Paul A.; de Fraine, Paul; Rathmell, William G.; and Gatehouse, Diana M., 4,289,526, Cl. 71-92.000.

Imre, Laszlo; Horstmann, Walter; and Leopold, Hans-Gerhard, to Bayer Aktiengesellschaft. Process for the preparation of 1,4-diazabicyclo-(2,2,2)-octane. 4,289,881, Cl. 544-352.000.

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Inagawa, Takashi; Kushida, Naoto; Sekiguchi, Akira; Ikeda, Matujiro; Sugawara, Hidetoshi; and Naito, Kunio, to Nippon Electric Co., Ltd. Flat electromagnetic relay. 4,290,037, Cl. 335-202.000.

Industrial Filter & Pump Mfg. Co.: *See*—
Schmidt, Henry, Jr.; Cederholm, Allen E.; and Zievers, James F., 4,289,630, Cl. 210-785.000.

Industrie Pirelli S.p.A.: *See*—
Franchini, Carlo; and Maiocchi, Luigi, 4,289,185, Cl. 152-361.0DM.

Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See*—
Reim, Werner; Gernlein, Hermann; and Zimmermann, Helmuth, 4,289,228, Cl. 198-339.000.

Industronics, Inc.: *See*—
Lyman, Lawrence C., 4,289,484, Cl. 432-241.000.

Ingersoll-Rand Company: *See*—
Chaiko, Walter M., 4,289,426, Cl. 405-259.000.

Innocenti Santeustacchio S.p.A.: *See*—
Nessi, Aurindo, 4,289,012, Cl. 72-209.000.

Innovate, Inc.: *See*—
Sargeant, Roger E., 4,289,486, Cl. 433-118.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,289,947, Cl. 219-69.00D.

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Inoue, Toshizo. Bevel gear cutting device. 4,289,433, Cl. 409-29.000.

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Norel, Guy; and Desbrandes, Robert, 4,289,025, Cl. 73-152.000.

Institute of Gas Technology: *See*—
Lee, Tien S.; Sammells, Anthony F.; and Remick, Robert J., 4,289,835, Cl. 429-50.000.
Tarman, Paul B.; and Chynoweth, David P., 4,289,625, Cl. 210-603.000.

Intec Corporation: *See*—
Baker, Cole H., 4,289,964, Cl. 250-308.000.

INTERATOM, Internationale Atomreaktorbau GmbH: *See*—
Parr, Armin; Kleffner, Harald; and Leder, Harald, 4,289,582, Cl. 176-38.000.

International Business Machines Corporation: *See*—
Alcorn, George E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,289,834, Cl. 428-601.000.
Alpaugh, Warren A.; Macur, George J.; and Sharkness, James E., 4,289,594, Cl. 204-158.00R.
Bare, Gary T.; and Zimmerman, Lee T., 4,290,138, Cl. 371-29.000.
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., 4,290,079, Cl. 357-71.000.
Cornelius, Rorger W.; Hill, James D.; and Quinn, Paul A., Jr., 4,289,411, Cl. 400-126.000.
Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; Martone, James F.; and Sabad, Joseph J., 4,289,666, Cl. 260-23.00H.
Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; and Sabad, Joseph J., 4,289,670, Cl. 260-28.5AV.
Dollenmayer, William L., 4,289,412, Cl. 400-171.000.
Economy, James; Lyerla, James R.; and Pederson, Lester A., 4,289,573, Cl. 156-643.000.
Hovel, Harold J., 4,289,920, Cl. 136-246.000.
Konian, Richard R.; and Walsh, James L., 4,289,978, Cl. 307-270.000.
Li, Pei-Ching, 4,289,539, Cl. 106-286.800.
McIntosh, Charles M.; and Schmeckenbecher, Arnold F., 4,289,719, Cl. 264-61.000.
Minshull, John F.; and Brazdil, Pavel, 4,290,084, Cl. 358-260.000.
Olson, Stephen T., 4,289,983, Cl. 310-49.00R.

International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,289,146, Cl. 131-276.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,289,705, Cl. 260-345.100.
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,289,145, Cl. 131-276.000.
Vinals, Joaquin; and Kiwala, Jacob, 4,289,661, Cl. 252-522.00R.
Yoshida, Takao; and Vock, Manfred H., 4,289,700, Cl. 260-340.90R.

International Paper Company: *See*—
Hung, John H., 4,289,125, Cl. 128-156.000.

International Playtex, Inc.: *See*—
Sterling, Larry D.; and Melvin, Wilbert, Jr., 4,288,999, Cl. 68-13.00R.

International Telephone and Telegraph Corporation: *See*—
LeGrand, Jesse S., 4,290,028, Cl. 331-1.00A.

Intersil, Inc.: *See*—
Squires, David R., 4,290,100, Cl. 363-60.000.

Isco, Inc.: *See*—
Allington, Robert W., 4,289,403, Cl. 356-349.000.

Ishida, Toshihiko; and Satou, Takateru, to TDK Electronics Co. Ltd. Magnetic tape cassette. 4,289,285, Cl. 242-199.000.

Ishihara, Masamitsu. Underwater pump. 4,289,456, Cl. 417-364.000.

Ishihara, Tadao: *See*—
Kubota, Shigeo; Ishihara, Tadao; and Kikuchi, Masahiro, 4,289,400, Cl. 356-376.000.

Ishikawa Giken Kogyo Kabushiki Kaisha: *See*—
Kimura, Junichi, 4,289,680, Cl. 260-37.00R.

Ishikawa, Hiroshi; and Ichikawa, Mamoru. Vehicle level detector. 4,290,044, Cl. 340-52.00H.

Ishikawa, Wataru; Fujiwhara, Mitsuto; Kojima, Tamotsu; Endo, Takaya; and Kato, Katsunori, to Konishiroku Photo Industry Co., Ltd. Method of forming dye image. 4,289,847, Cl. 430-389.000.

Ishise, Kojiro, to Sumitomo Electric Industries, Ltd. Method of connecting cables. 4,289,721, Cl. 264-85.000.

Isogai, Nobuo; Okawa, Takashi; and Wakui, Natsuko, to Mitsubishi Gas Chemical Company, Inc. Process for producing methylisobutylketone. 4,289,911, Cl. 568-396.000.

Itaya, Reijiro, to Kabushiki Kaisha Itaya Seisaku Sho. Coil spring manufacturing machine. 4,289,004, Cl. 72-7.000.

Ito, Kazuhiko: *See*—
Nakanishi, Kiyoshi; Ito, Kazuhiko; Okumura, Takeshi; Iezuka, Isamu; and Yasukawa, Masao, 4,289,099, Cl. 123-307.000.

Ito, Takaaki; and Nakamura, Norihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Variable venturi type carburetor. 4,289,715, Cl. 261-44.00C.

Itoh, Manabu: *See*—
Takada, Shigetaka; Nomura, Masaaki; and Itoh, Manabu, 4,289,104, Cl. 123-471.000.

Itoh, Tsutomu, to Onoda Cement Co., Ltd. Powder electro-charging device and electrostatic powder painting device. 4,289,278, Cl. 239-706.000.

ITT Industries, Inc.: *See*—
Lupertz, Hans-Henning; and Berisch, Volker, 4,289,359, Cl. 303-6.00C.

Itzkan, Irving; Kent, Herbert P.; Mack, Michael E.; and Morton, Richard G., to Avco Everett Research Laboratory, Inc. Laser ceilometer signal processing means. 4,289,397, Cl. 356-5.000.

Ivanov, Boris G.: *See*—
Mitrofanov, Evgeny S.; Ivanov, Boris G.; Ivanov, Nikolai A.; Kaljunov, Gennady A.; and Khinich, Isaak Y., 4,289,280, Cl. 241-207.000.

Ivanov, Nikolai A.: *See*—
Mitrofanov, Evgeny S.; Ivanov, Boris G.; Ivanov, Nikolai A.; Kaljunov, Gennady A.; and Khinich, Isaak Y., 4,289,280, Cl. 241-207.000.

Iwasaki, Kyuhachiro: *See*—
Jinnai, Koichiro; and Iwasaki, Kyuhachiro, 4,290,073, Cl. 346-75.000.

Iwasaki, Masami: *See*—
Matsui, Kazumi; Takasue, Takashi; and Iwasaki, Masami, 4,289,227, Cl. 198-334.000.

Iwasaki Tsushinki Kabushiki Kaisha: *See*—
Uchida, Kozo, 4,289,399, Cl. 356-226.000.

Iwasawa, Teruo: *See*—
Takayama, Shuichi; Tsuboshima, Kosaku; Nakajima, Yoshio; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,289,959, Cl. 250-201.000.

Iwata, Hiroto, to Jidosha Kiki Co., Ltd. Rotary hydraulic device. 4,289,454, Cl. 417-300.000.

J. M. Huber Corporation: *See*—
Andrews, Claude R., 4,289,629, Cl. 210-737.000.

Jabsen, Felix S.; Schluderberg, Donald C.; and Paulson, Arnold E., to Babock & Wilcox Company, The. Modular heat exchangers for consolidated nuclear steam generator. 4,289,196, Cl. 165-83.000.

Jacob, Charles W., to United States Steel Corporation. Apparatus for singly discharging cylindrical workpieces from an inclined rollway. 4,289,443, Cl. 414-748.000.

Jacobellis, Alfonse A., to Greer Hydraulics, Incorporated. Method of manufacturing pressure vessels by heat forming. 4,288,894, Cl. 29-157.00R.

Jacobs, Bernardus A. J.; De Poorter, Adriaan W.; and Zalm, Pieter, to U.S. Philips Corporation. Optical recording device having several ablative recording layers. 4,290,075, Cl. 430-270.000.

Jaffe, Joseph, to Chevron Research Company. Comulled silica-alumina base denitrification catalyst. 4,289,653, Cl. 252-453.000.

Jagenberg-Werke: *See*—
Kurth, Wilfried, 4,289,961, Cl. 250-223.00B.

Jalie, Mohammed. Ophthalmic spectacle lenses having a hyperbolic surface. 4,289,387, Cl. 351-159.000.

James River Graphics, Inc.: *See*—
DiPippo, Carmine A., 4,289,839, Cl. 430-177.000.

James, Robert C., to Hayssen Manufacturing Company. Form-fill-seal packaging method and apparatus. 4,288,965, Cl. 53-451.000.

Jang, Choong-Gook: *See*—
Pasarela, Nunzio R.; and Jang, Choong-Gook, 4,289,525, Cl. 71-92.000.

Janner, Karl; Gregorius, Klaus; and Muller, Reinhold, to Kraftwerk Union Aktiengesellschaft. Method of separating isotope compounds by selective excitation and reaction in a solid matrix. 4,289,592, Cl. 204-157.10R.

Janome Sewing Machine Co., Ltd.: *See*—
Takenoya, Hideaki; and Tonomura, Yoshinobu, 4,289,084, Cl. 112-158.00E.
Takenoya, Hideaki; Watanabe, Kazuo; Nakagawa, Tamotsu; and Tonomura, Yoshinobu, 4,289,087, Cl. 112-254.000.

Janssen Pharmaceutica, N.V.: *See—*
Mesens, Jean, 4,289,783, Cl. 424-273.00R.
Japan Air Lines Co., Ltd.: *See—*
Nakamura, Shinji; and Yamakawa, Katsuyoshi, 4,289,074, Cl. 104-284.000.
Namba, Takamasa; Yanagawa, Hidekata; Fujimoto, Nobuo; Mori, Takehiko; and Yamada, Takayoshi, 4,289,263, Cl. 226-196.000.
Japan Atomic Energy Research Institute: *See—*
Hagiwara, Miyuki; and Morita, Yosuke, 4,289,687, Cl. 260-45.85E.
Japan Packaging Machinery Manu. Assn.: *See—*
Seko, Kiyoshi; and Ichikawa, Mamoru, 4,288,967, Cl. 53-550.000.
Seko, Kiyoshi; and Ichikawa, Mamoru, 4,288,968, Cl. 53-550.000.
Jastrab, Alexander G., to Bell & Howell Company. Microfiche reader printer with interchangeable carriages. 4,289,396, Cl. 355-45.000.
Jayme, Manfred: *See—*
Mohler, Werner; Jayme, Manfred; and Komarek, Jaromir, 4,289,776, Cl. 424-253.000.
Jenoptik Jena GmbH, Jena: *See—*
Mohr, Joachim, 4,289,401, Cl. 356-305.000.
Jensen, Henning. Underwater or weatherproof light. 4,290,094, Cl. 362-145.000.
Jensen, Knud B.: *See—*
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,289,375, Cl. 350-96.230.
Jewett, David N., to Energy Materials Corporation. Method and apparatus for producing crystalline ribbons. 4,289,571, Cl. 156-617.00H.
Jidosha Kiki Co., Ltd.: *See—*
Iwata, Hiroto, 4,289,454, Cl. 417-300.000.
Jinkins, C. Eugene; and Legler, Bobby, to Dow Chemical Co., The. Stabilized phenolic resins. 4,289,814, Cl. 427-385.500.
Jinnai, Koichiro; and Iwasaki, Kyuhachiro, to Ricoh Co., Ltd. Ink-jet recording apparatus. 4,290,073, Cl. 346-75.000.
Johansson, Ingvar K. G., to Svenska Traforskningsinstitutet. Method of producing synthetic resin from waste products. 4,289,663, Cl. 260-17.500.
John Fluke Mfg. Co., Inc.: *See—*
Everett, Stephen M., 4,289,367, Cl. 339-64.00R.
Johnson, Allen S., Jr. Thermally insulated rotary kiln and method of making same. 4,289,479, Cl. 432-3.000.
Johnson, Allen S., Jr. Bag-type filter apparatus with venturi-supported air diffuser. 4,289,511, Cl. 55-302.000.
Johnson, George A.: *See—*
Hooper, David C.; Johnson, George A.; and Peter, Donald, 4,289,641, Cl. 252-96.000.
Johnson, Larry K.; and Gates, Kenneth L., to Lawrence Brothers, Inc. Frame corner connector. 4,288,887, Cl. 16-105.000.
Johnson, Matthey & Co., Limited: *See—*
Acres, Gary J. K.; and Hutchings, Robert M., 4,289,737, Cl. 423-245.000.
Johnson Matthey Inc.: *See—*
Hunter, James B.; McGuire, George; D'Alessandro, A. F.; and Lawlor, Larry L., 4,289,652, Cl. 252-437.000.
Johnson, Paul H., to Phillips Petroleum Company. Carbon black recovery. 4,289,742, Cl. 423-450.000.
Johnson, Roy A., to Upjohn Company, The. 2-Decarboxy-2-tetrazolyl-9-deoxy-5,9α-epoxy-4,5-cis-17,18-tetradehydro-PGF_1 compounds. 4,289,877, Cl. 542-431.000.
Johnson, Roy A., to Upjohn Company, The. 2-Decarboxy-2-tetrazolyl-trans-2,3,4,5-tetradehydro-PGI_1 compounds. 4,289,878, Cl. 542-431.000.
Johnson, Roy A., to Upjohn Company, The. 2-Decarboxy-2-tetrazolyl-4-halo-5,9-epoxy-9-deoxy-PGF_1 compounds. 4,289,888, Cl. 548-253.000.
Johnston, J. O'Neal: *See—*
Metcalf, Brian W.; and Johnston, J. O'Neal, 4,289,762, Cl. 424-242.000.
Johnston, Michael L.; Gordon, Loren J.; and Weinauer, Dietrich E., to General Mills, Inc. Lasagna noodle rippler. 4,289,470, Cl. 425-336.000.
Jones, C. Bradford; and Kinard, Richard D., to Du Pont de Nemours, E. I., and Company. Process for heating thin surface layers. 4,289,480, Cl. 432-8.000.
Jones & Laughlin Steel Corporation: *See—*
Bucher, John H.; Butler, John F.; and Held, John F., 4,289,548, Cl. 148-12.00B.
Jones, Winton D.; and Miller, Francis P., to Richardson-Merrell Inc. 5-(Chlorophenyl)-6H-1,3,4-thiadiazine-2-amines. 4,289,767, Cl. 424-246.000.
Jordan, Thomas F., to Continental Group, Inc., The. Easy opening container with tab having separate opening element. 4,289,250, Cl. 220-269.000.
Joubert, Daniel, to Rhone-Poulenc Industries. Stabilization of anhydrous sodium metasilicate. 4,289,643, Cl. 252-103.000.
Jung, Bernhard; and Teichmann, Michael, to Keiper Automobiltechnik GmbH & Co. KG. Drive apparatus having at least two electric motors. 4,289,997, Cl. 318-113.000.
Junker, Erwin. Shaping roll. 4,289,110, Cl. 125-11.0CD.
Jurek, Dennis J.; Guettel, Marvin A.; and Aslin, Michael, to Square D Company. Automatic voltage compensation for digital welder control system. 4,289,948, Cl. 219-110.000.
Jurek, Dennis J., to Square D Company. Power factor monitoring and control system for resistance welding with line disturbance immunity. 4,289,951, Cl. 219-110.000.
Kabel- und Metallwerke Gutehoffnungshutte AG: *See—*
Glander, Fritz; and Voigt, Hermann U., 4,289,860, Cl. 525-263.000.
Kabel- und Metallwerke Gutehoffnungshutte A.G.: *See—*
Voigt, Hermann U., 4,289,716, Cl. 264-45.900.
Kablikov, Vladislav A.: *See—*
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,289,731, Cl. 422-206.000.
Kabushiki Kaisha Daisei Kikai: *See—*
Suzuki, Tomosaburo, 4,289,614, Cl. 209-308.000.
Kabushiki Kaisha Fujikoshi: *See—*
Tochizawa, Ikuo, 4,290,039, Cl. 335-262.000.
Kabushiki Kaisha Fujikoshi t/a Nachi-Fujikoshi Corp.: *See—*
Hachisuka, Takeji, 4,289,833, Cl. 428-544.000.
Kabushiki Kaisha Itaya Seisaku Sho: *See—*
Itaya, Reijiro, 4,289,004, Cl. 72-7.000.
Kabushiki Kaisha Kogai Boshi Sogo Kenkyusho: *See—*
Fushihara, Tomotsuru, 4,289,599, Cl. 204-275.000.
Kabushiki Kaisha Mitutoyo Seisakusho: *See—*
Mizuno, Ichiro; and Nakahara, Masao, 4,288,924, Cl. 33-147.00F.
Kabushiki Kaisha Suwa Seikosha: *See—*
Kasai, Kazutomo, 4,289,549, Cl. 148-101.000.
Ushikoshi, Kenichi, 4,290,129, Cl. 368-66.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Yoshida, Yoshiaki; Suzuki, Osamu; Onoue, Keiji; and Seiki, Kazuo, 4,288,975, Cl. 57-263.000.
Kadi-Ogly, Ibragim A.: *See—*
Aroshidze, Jury V.; Kadi-Ogly, Ibragim A.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; Fomin, Boris I.; and Yankov, Anatoly F., 4,289,984, Cl. 310-54.000.
Kadija, Igor V., to Olin Corporation. Diaphragm structure for electrolytic cells for the electrolysis of aqueous salt solutions. 4,289,601, Cl. 204-296.000.
Kagiwada, Reynold S.; Yen, Kuo-hsiung; and Lau, Kei-fung, to TRW Inc. Shallow bulk acoustic wave devices employing energy trapping. 4,290,033, Cl. 333-141.000.
Kahn, Harvey R., to Alan I. Gerald Corporation. Firearm with interchangeable barrels and ammunition cylinders. 4,288,938, Cl. 42-59.000.
Kaiser, Steven W., to Union Carbide Corporation. Preparation of methanol from synthesis gas with promoted palladium catalysts. 4,289,709, Cl. 518-714.000.
Kaiser, Steven W., to Union Carbide Corporation. Process for producing methanol from synthesis gas with palladium-calcium catalysts. 4,289,710, Cl. 518-717.000.
Kalina, Alexander I. Method and apparatus for conveying material in pipeline capsules. 4,289,429, Cl. 406-105.000.
Kalinowski, Robert E.; and Vincent, Gary A., to Dow Corning Corporation. Non-bleeding transparent silicone additives for plastics. 4,289,859, Cl. 525-104.000.
Kaljunov, Gennady A.: *See—*
Mitrofanov, Evgeny S.; Ivanov, Boris G.; Ivanov, Nikolai A.; Kaljunov, Gennady A.; and Khinich, Isaak Y., 4,289,280, Cl. 241-207.000.
Kalkbrenner, Francis W.: *See—*
Hysell, Robert E.; and Kalkbrenner, Francis W., 4,290,080, Cl. 357-81.000.
Kallaur, Michael, to Freeman Chemical Corporation. Sheet molding compound. 4,289,684, Cl. 260-40.00R.
Kalman, James H. Step tread plate. 4,289,819, Cl. 428-57.000.
Kameda, Tamotsu, to Yasui Sangyo Co., Ltd. Hydraulic lifting jack having a safety lifting saddle. 4,289,298, Cl. 254-8.00B.
Kameda, Tamotsu, to Yasui Sangyo Co., Ltd. Hydraulic lifting jack including a safety device for an elevator therein. 4,289,299, Cl. 254-8.00B.
Kaminski, Elton G., to Stolle Corporation, The. Article feeding apparatus. 4,289,231, Cl. 198-834.000.
Kanazaka, Yoshihiro, to Yoshida Kogyo K. K. Hook for a hook-and-eye fastener. 4,288,890, Cl. 24-227.000.
Kane, Bernard J.; and Traynor, Sean G., to SCM Corporation. Alkoxides of 2-pinanol. 4,289,917, Cl. 585-359.000.
Kaneto, Kimikazu: *See—*
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, 4,289,194, Cl. 164-170.000.
Kangol Magnet Limited: *See—*
Ashworth, Roger A., 4,289,352, Cl. 297-473.000.
Kanner, Bernard: *See—*
Herdle, William B.; Kanner, Bernard; and Bailey, Donald L., 4,289,889, Cl. 556-470.000.
Kanno, Iwao: *See—*
Koga, Kenichiro; Hirose, Yoshiharu; Kanno, Iwao; Uemura, Kazuo; and Miura, Shuichi, 4,289,965, Cl. 250-363.00S.
Kantlehner, Jerry R.: *See—*
Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E., 4,289,569, Cl. 156-580.200.
Kapitonova, Zinaida P. Microwave device. 4,289,992, Cl. 315-39.770.
Kaplan, Irwin M. Method of and system for detecting marine obstacles. 4,290,043, Cl. 340-29.000.
Kapp, Joachim-Friedrich: *See—*
Laurent, Henry; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, 4,289,763, Cl. 424-243.000.
Karl Thomae GmbH: *See—*
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,289,775, Cl. 424-251.000.

Karuhn, Richard F.: *See—*
Berg, Robert H.; and Karuhn, Richard F., 4,290,011, Cl. 324-71.0CP.

Kasai, Kazutomo, to Kabushiki Kaisha Suwa Seikosha. Resin bonded permanent magnet composition. 4,289,549, Cl. 148-101.000.

Kasper, Robin: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,289,145, Cl. 131-276.000.

Katakura, Kazuo: *See—*
Tamamushi, Masahiro; and Katakura, Kazuo, 4,289,345, Cl. 296-37.160.

Katayama Chemical Works Co., Ltd.: *See—*
Katayama, Sakae; and Umekawa, Osamu, 4,289,581, Cl. 162-161.000.

Katayama, Masato: *See—*
Marumo, Shingo; and Katayama, Masato, 4,289,852, Cl. 435-136.000.

Katayama, Minoru: *See—*
Taniguchi, Koichi; Katayama, Minoru; Sangu, Osamu; and Hori, Shinichi, 4,290,109, Cl. 364-481.000.

Katayama, Sakae; and Umekawa, Osamu, to Katayama Chemical Works Co., Ltd. Microbicidal slimicide compositions for industrial use. 4,289,581, Cl. 162-161.000.

Katayama, Yoshifumi: *See—*
Shimada, Toshikazu; Katayama, Yoshifumi; and Komatsubara, Kiichi F., 4,289,822, Cl. 428-212.000.

Kato, Hajime, to Fuji Photo Film Co., Ltd. Recording sheet. 4,289,332, Cl. 282-27.500.

Kato, Katsunori: *See—*
Ishikawa, Wataru; Fujiwhara, Mitsuto; Kojima, Tamotsu; Endo, Takaya; and Kato, Katsunori, 4,289,847, Cl. 430-389.000.

Katsumata, Masaaki; Onoda, Michio; Takagi, Yasuo; and Yoneda, Kenji, to Nissan Motor Company, Limited. Engine spark timing controlling device. 4,289,102, Cl. 123-425.000.

Katunin, Vladimir M.; and Nakrokhin, Vladimir G. Voltage frequency meter of synchronous electrical machine. 4,289,974, Cl. 307-527.000.

Kavanaugh, Harvey H. Method of forming structural walls and roofs. 4,288,962, Cl. 52-743.000.

Kawai, Kouichi: *See—*
Matsumoto, Masashige; Kobuna, Hideaki; Hiraide, Seiji; and Kawai, Kouichi, 4,289,575, Cl. 156-656.000.

Kawamata, Motoo: *See—*
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,289,699, Cl. 260-326.5FM.

Kawamura, Yasutaro: *See—*
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, 4,289,194, Cl. 164-170.000.

Kawasaki, Haruhiko; Koiwai, Hideshi; and Matsumura, Shizuo, to Kayaba Kogyo Kabushiki Kaisha. Pressure control valve. 4,289,160, Cl. 137-491.000.

Kawazoe, Michio. Camera supporting device for low angle or close-up photography. 4,289,393, Cl. 354-293.000.

Kayaba Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Haruhiko; Koiwai, Hideshi; and Matsumura, Shizuo, 4,289,160, Cl. 137-491.000.

Kayano, Hideo: *See—*
Yajima, Seishi; Shishido, Toetsu; Okamura, Kiyohito; Kayano, Hideo; Hayashi, Josaburo; and Kobayashi, Hiroshi, 4,289,720, Cl. 264-63.000.

Keane Monroe Corporation: *See—*
Sorber, Robert E.; and Gallion, James A., 4,289,995, Cl. 318-9.000.

Kearney & Trecker Corporation: *See—*
Kielma, Ervin J.; Schabowski, Albin J.; and Currer, John T., 4,288,909, Cl. 29-568.000.

Kearns, Kenneth L. Physiological occurrence, such as apnea, monitor and X-ray triggering device. 4,289,142, Cl. 128-716.000.

Kehl, William L.: *See—*
Hill, Robert W.; Kehl, William L.; and Lynch, Thomas J., 4,289,863, Cl. 526-106.000.

Keil, Karl-Heinz: *See—*
Hudec, Gustav; Keil, Karl-Heinz; Kohler, Volker; and Rosenbusch, Kurt, 4,289,665, Cl. 260-21.000.

Keim, Karl H., to Gloucester Engineering Co., Inc. Apparatus for forming and trimming articles from a web. 4,289,469, Cl. 425-302.100.

Keiper Automobiltechnik GmbH & Co. KG: *See—*
Jung, Bernhard; and Teichmann, Michael, 4,289,997, Cl. 318-113.000.

Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing phenylpropanolamine. 4,289,749, Cl. 424-28.000.

Keller, Norman L., to Pullman Incorporated. Conveyor table slab stop arrangement. 4,289,229, Cl. 198-633.000.

Kempf, August J.: *See—*
Mrozik, Helmut H.; MacConnell, John G.; and Kempf, August J., 4,289,760, Cl. 424-181.000.

Kennair, Dorothy J.: *See—*
Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; Martone, James F.; and Sabad, Joseph J., 4,289,666, Cl. 260-23.00H.
Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; and Sabad, Joseph J., 4,289,670, Cl. 260-28.5AV.

Kent, Herbert P.: *See—*
Itzkan, Irving; Kent, Herbert P.; Mack, Michael E.; and Morton, Richard G., 4,289,397, Cl. 356-5.000.

Kenyon, David L. Display security device. 4,289,242, Cl. 211-4.000.

Kernforschungsanlage Julich GmbH: *See—*
Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann J., 4,289,756, Cl. 424-101.000.

Kessler, Milton. Method of fabricating vacuum sizing apparatus. 4,288,905, Cl. 29-526.00R.

Key Pharmaceuticals, Inc.: *See—*
Keith, Alec D.; and Snipes, Wallace, 4,289,749, Cl. 424-28.000.

Khinich, Isaak Y.: *See—*
Mitrofanov, Evgeny S.; Ivanov, Boris G.; Ivanov, Nikolai A.; Kaljunov, Gennady A.; and Khinich, Isaak Y., 4,289,280, Cl. 241-207.000.

Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F. Apparatus for pyrolysis of hydrocarbon starting products. 4,289,731, Cl. 422-206.000.

Khoe, Giok D.: *See—*
Franken, Adrianus J. J.; Khoe, Giok D.; Kuyt, Gerard; Van Leest, Johannes H. F. M.; Nicia, Antonius J. A.; Potters, Cornelis J. T.; and Smulders, Hendricus F. G., 4,289,374, Cl. 350-96.200.

Khutoretsky, Gary M.: *See—*
Popov, Jury S.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,289,985, Cl. 310-61.000.

Kidwell, John H.: *See—*
Carter, Hudson R.; Kidwell, John H.; and Prueter, William P., 4,289,514, Cl. 55-398.000.

Kiehn, Robert M., to Standard Oil Company (Indiana). Laser-based deflection measuring method and apparatus. 4,289,404, Cl. 356-351.000.

Kiel, Friedrich: *See—*
Schnee, Rolf; Kraus, Franz; Kiel, Friedrich; Kliem, Helmut; Krick, Wolfgang; and Landgraf, Herbert, 4,290,142, Cl. 455-3.000.

Kielma, Ervin J.; Schabowski, Albin J.; and Currer, John T., to Kearney & Trecker Corporation. Automatic tool changer for machine tool. 4,288,909, Cl. 29-568.000.

Kikuchi, Masahiro: *See—*
Kubota, Shigeo; Ishihara, Tadao; and Kikuchi, Masahiro, 4,289,400, Cl. 356-376.000.

Kiliman, D. A.: *See—*
Wissel, F. A.; and Kiliman, D. A., 4,290,143, Cl. 455-38.000.

Killinger, Marvin H., to Bendix Corporation, The. Brake system warning circuit. 4,290,045, Cl. 340-52.00C.

Killmeyer, Charles W., deceased (by Killmeyer, Elizabeth A., executrix); Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., to PPG Industries, Inc. Apparatus for formation of pultruded fiber glass reinforced twisted article. 4,289,465, Cl. 425-111.000.

Killmeyer, Elizabeth A., executrix: *See—*
Killmeyer, Charles W., deceased; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,289,465, Cl. 425-111.000.

Kim, Keun Y.: *See—*
Dyroff, David R.; Graf, Gary F.; Kim, Keun Y.; and Suchanek, Walton F., Jr., 4,289,753, Cl. 424-48.000.

Kimball, David D. Protective cover and method for treating hair. 4,289,150, Cl. 132-7.000.

Kimber, Michael P.: *See—*
Duncan, Michael E.; Whittington, Philip J.; and Kimber, Michael P., 4,289,111, Cl. 126-391.000.

Kimoto, Koichi: *See—*
Hallman, Robert W.; Kimoto, Koichi; and Okai, Sakuo, 4,289,071, Cl. 101-395.000.

Kimura, Junichi, to Ishikawa Giken Kogyo Kabushiki Kaisha. Heat resistant and fire-proof synthetic resin material containing inorganic substances and process of producing same. 4,289,680, Cl. 260-37.00R.

Kimura, Mamoru: *See—*
Kubo, Masayoshi; Nakanishi, Michio; and Kimura, Mamoru, 4,289,873, Cl. 528-357.000.

Kinard, Richard D.: *See—*
Jones, C. Bradford; and Kinard, Richard D., 4,289,480, Cl. 432-8.000.

Kindig, James K.; and Turner, Ronald L., to Hazen Research, Inc. Process for beneficiating sulfide ores. 4,289,528, Cl. 75-1.00R.

Kindig, James K.; and Turner, Ronald L., to Hazen Research, Inc. Process for beneficiating sulfide ores. 4,289,529, Cl. 75-1.00R.

Kindlmann, Peter J.: *See—*
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,289,946, Cl. 164-503.000.

Kinematics, Inc.: *See—*
Haluko, Michael, Jr., 4,289,040, Cl. 74-50.000.

King, Peter F.; and Beyer, George J., to Hooker Chemicals & Plastics Corp. Aqueous acidic lubricant coating composition and method. 4,289,547, Cl. 148-6.15R.

Kinugawa, Masumi; Omori, Norio; and Sueishi, Motoharu, to Nippondenso Co., Ltd. Apparatus for controlling rotation speed of engine. 4,289,100, Cl. 123-339.000.

Kinzel, Richard: *See—*
Norberg, Helmut; and Kinzel, Richard, 4,289,098, Cl. 123-299.000.

Kirkland, Kerry G., to Armco Inc. Remote multiple string well completion. 4,289,206, Cl. 166-348.000.

Kishi, Hiroyasu: *See—*
Sakamoto, Junji; and Kishi, Hiroyasu, 4,289,981, Cl. 307-350.000.

Kita, Yuzo: *See—*
Sugie, Mamoru; Yamaguchi, Noboru; Mayama, Koichi; Kita, Yuzo; Yoshizawa, Shigeru; Saito, Nobuo; and Asano, Atsushi, 4,290,117, Cl. 365-15.000.

Kitamura, Nobuaki: *See*—
Masuda, Kouji; Mizukami, Masao; and Kitamura, Nobuaki, 4,290,119, Cl. 365-189.000.

Kitzen, Maurice R.: *See*—
Wall, Fraser M.; Kitzen, Maurice R.; and Kreipe, T. Frederick, 4,289,475, Cl. 431-11.000.

Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,289,146, Cl. 131-276.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,289,705, Cl. 260-345.100.
Vinals, Joaquin; and Kiwala, Jacob, 4,289,661, Cl. 252-522.00R.

Klee, Rudolf J.: *See*—
Herold, Heiko; Herold, Richard; Klee, Rudolf J.; and Muschelknautz, Edgar, 4,288,893, Cl. 28-266.000.

Kleffner, Harald: *See*—
Parr, Armin; Kleffner, Harald; and Leder, Harald, 4,289,582, Cl. 176-38.000.

Kleiner, Fredric; Roy, Pradip K.; and Kuchman, Michael J., to General Foods Corporation. Process of preparing gasified candy. 4,289,794, Cl. 426-660.000.

Kleinschmit, Peter: *See*—
Voigt, Carl; Kleinschmit, Peter; and Walter, Eberhard, 4,289,741, Cl. 423-376.000.

Klepfer, Harlan A. Disposable protective garment. 4,288,877, Cl. 2-48.000.

Kleykamp, Donald L.; and Holden, Homer N., to Dayco Corporation. Railway center bearing wear liner. 4,289,077, Cl. 105-199.00C.

Kliem, Helmut: *See*—
Schnee, Rolf; Kraus, Franz; Kiel, Friedrich; Kliem, Helmut; Krick, Wolfgang; and Landgraf, Herbert, 4,290,142, Cl. 455-3.000.

Kliklok Corporation: *See*—
Collura, Peter C.; and Baker, Thomas R., 4,289,491, Cl. 493-124.000.

Kling, Alberto. Rotor for operation in a flow medium. 4,289,450, Cl. 416-192.000.

Klockner-Humboldt-Deutz AG: *See*—
Deussner, Herbert, 4,289,483, Cl. 432-106.000.

Klockner-Humboldt-Deutz Akt.: *See*—
Brockmann, Heinz, 4,289,611, Cl. 209-144.000.

Knape & Vogt Manufacturing Co.: *See*—
Miller, Calvin K., 4,289,290, Cl. 248-251.000.

Knight, Gordon R.: *See*—
Bates, Roger D.; and Knight, Gordon R., 4,290,122, Cl. 365-234.000.

Knight, Webster B. Sequential power distribution circuit. 4,290,057, Cl. 340-539.000.

Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,289,286, Cl. 244-1.00R.

Knopp, Paul V.; and Burant, Walter, Jr., to Sterling Drug, Inc. Wastewater treatment. 4,289,626, Cl. 210-616.000.

Knorreck, Peter, to Robert Bosch GmbH. Centrifugal rpm governor for internal combustion engines. 4,289,101, Cl. 123-364.000.

Knott, Jack E., II, to American Can Company. Ethylene-vinyl alcohol copolymer gas barrier layer with phenol additive. 4,289,830, Cl. 428-475.800.

Knudsen, Poul U.: *See*—
Andersen, Axel; Knudsen, Poul U.; and Jensen, Knud B., 4,289,375, Cl. 350-96.230.

Koba, Yoshinori, to Meinan Machinery Works, Inc. Veneer reinforcing unit and a veneer reinforcing device using the same. 4,289,179, Cl. 144-211.000.

Kobayashi, Hiroshi: *See*—
Yajima, Seishi; Shishido, Toetsu; Okamura, Kiyohito; Kayano, Hideo; Hayashi, Josaburo; and Kobayashi, Hiroshi, 4,289,720, Cl. 264-63.000.

Kobayashi, Masahisa, to Nippon Electric Co., Ltd. Transmitter for a telewriter. 4,289,926, Cl. 178-19.000.

Kobe, Inc.: *See*—
Erickson, John W., 4,289,610, Cl. 209-18.000.

Kobori, Toshio; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Exposure control device for a camera. 4,289,389, Cl. 354-31.000.

Kobori, Toshio; Yamazaki, Yasuo; and Uchida, Isamu, to Minolta Camera Kabushiki Kaisha. Pentagonal roof reflecting mirror assembly. 4,289,392, Cl. 354-225.000.

Kobuna, Hideaki: *See*—
Matsumoto, Masashige; Kobuna, Hideaki; Hiraide, Seiji; and Kawai, Kouichi, 4,289,575, Cl. 156-656.000.

Kochanowski, Guenter: *See*—
Brunner, Heinrich; Drebinger, Peter; Hoehne, Peter; Hoisl, Johann; Kochanowski, Guenter; and Wimmer, Walter, 4,290,136, Cl. 371-25.000.

Koehler, Charles E.; McClellan, Thomas R.; and Murray, Pat L., to Upjohn Company, The. Polyol-fluorocarbon-aminetriol blend and polyisocyanurate foams therefore. 4,289,858, Cl. 521-131.000.

Koehler, Waldemar; Blumenberg, Bernd; Vogel, Ludwig; and Hetzel, Eckhard, to BASF Aktiengesellschaft. Separating toluene diisocyanate and/or higher boiling solvents from distillation residues of the toluene diisocyanate manufacture using a fluidized bed. 4,289,589, Cl. 203-49.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Bolza-Schunemann, Hans B., 4,289,494, Cl. 493-405.000.

Koerber, Barbara M.: *See*—
Freenor, Francis J., III; and Koerber, Barbara M., 4,289,909, Cl. 568-315.000.

Koga, Kenichiro; Hirose, Yoshiharu; Kanno, Iwao; Uemura, Kazuo; and Miura, Shuichi, to Shimadzu Corporation. Emission computed tomograph. 4,289,965, Cl. 250-363.00S.

Koga, Nobuhito: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,289,699, Cl. 260-326.5FM.

Kohler, Volker: *See*—
Hudec, Gustav; Keil, Karl-Heinz; Kohler, Volker; and Rosenbusch, Kurt, 4,289,665, Cl. 260-21.000.

Kohno, Kaname, to Dai-Ichi Seiko Co., Ltd. Tape reel. 4,289,282, Cl. 242-71.800.

Koiwai, Hideshi: *See*—
Kawasaki, Haruhiko; Koiwai, Hideshi; and Matsumura, Shizuo, 4,289,160, Cl. 137-491.000.

Kojima, Hiroshi: *See*—
Sato, Takeshi; and Kojima, Hiroshi, 4,289,182, Cl. 152-209.00R.

Kojima, Tamotsu: *See*—
Ishikawa, Wataru; Fujiwhara, Mitsuto; Kojima, Tamotsu; Endo, Takaya; and Kato, Katsunori, 4,289,847, Cl. 430-389.000.

Kokotailo, George T., to Mobil Oil Corporation. Catalytic conversion with crystalline zeolite product constituting ZSM-5/ZSM-11 intermediates. 4,289,607, Cl. 208-120.000.

Kolc, Jaroslav: *See*—
Denkewalter, Robert G.; Kolc, Jaroslav; and Lukasavage, William J., 4,289,872, Cl. 528-328.000.

Kolker, Carl R., to Faxon Communications Corporation. Synchronization system for variable line length facsimile transceivers. 4,290,085, Cl. 358-264.000.

Kolling, Georg; Pietzka, Gerhard; Romey, Ingo; and Tillmanns, Harald, to Bergwerksverband GmbH; and Sigri Elektrographit GmbH. Method of producing an isotropic coke. 4,289,604, Cl. 208-106.000.

Kolycheck, Edmond G.; and Herman, Richard M., to B. F. Goodrich Company, The. Elastomeric polyurethanes coated with a vinyl chloride polymer powder. 4,289,825, Cl. 428-407.000.

Komarek, Jaromir: *See*—
Mohler, Werner; Jayme, Manfred; and Komarek, Jaromir, 4,289,776, Cl. 424-253.000.

Komatsu, Hideo: *See*—
Mizutani, Tatsumi; Ueki, Kazuyoshi; Iida, Shinya; and Komatsu, Hideo, 4,289,188, Cl. 156-626.000.

Komatsubara, Kiichi F.: *See*—
Shimada, Toshikazu; Katayama, Yoshifumi; and Komatsubara, Kiichi F., 4,289,822, Cl. 428-212.000.

Konian, Richard R.; and Walsh, James L., to International Business Machines Corp. Complementary transistor inverting emitter follower circuit. 4,289,978, Cl. 307-270.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Ishikawa, Wataru; Fujiwhara, Mitsuto; Kojima, Tamotsu; Endo, Takaya; and Kato, Katsunori, 4,289,847, Cl. 430-389.000.

Kontz, Robert F., to Owens-Illinois, Inc. Apparatus for synchronizing speed and angular position of power driven machines. 4,289,046, Cl. 74-711.000.

Kopp, Klaus F.; and Helbig, Joachim W. Therapy of conditions which may be associated with altered renal function and dosage forms therefor. 4,289,750, Cl. 424-33.000.

Kopp, Manfred K.: *See*—
Hanson, James A.; and Kopp, Manfred K., 4,289,967, Cl. 250-385.000.

Koppers Company, Inc.: *See*—
Latowski, Anthony A.; and Grib, William P., 4,289,485, Cl. 432-245.000.

Koronka, Paul, to Imperial Chemical Industries Limited. Coulter device for direct seed drills. 4,289,081, Cl. 111-88.000.

Kossoff, George: *See*—
Carpenter, David A.; Kossoff, George; and Radovanovich, George D., 4,289,140, Cl. 128-660.000.

Kostner, Richard C.: *See*—
Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C., 4,289,563, Cl. 156-423.000.

Kotaka, Fumitaka, to Pioneer Electronic Corporation. Focus servo device for use in an optical information read-out device. 4,290,132, Cl. 369-45.000.

Kozak, Andrei A.: *See*—
Stakhov, Alexei P.; Kozak, Andrei A.; Solyanichenko, Nikolai A.; Kuzmin, Ivan V.; and Azarov, Alexei D., 4,290,051, Cl. 340-347.0DD.

Kraft, Derald H., to Dyneer Corporation. Apparatus for hydraulically forming sheet metal pulleys. 4,289,007, Cl. 72-58.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Friesen, Eckart; Thogersen, Hans P.; and Kuhnel, Roland, 4,288,997, Cl. 62-434.000.
Janner, Karl; Gregorius, Klaus; and Muller, Reinhold, 4,289,592, Cl. 204-157.10R.
Puthawala, Anwer, 4,289,407, Cl. 366-75.000.

Krajewski, John J., to DeSoto, Inc. Air drying latex coating composition curable under ambient conditions and method of providing same. 4,289,675, Cl. 260-29.6CM.

Kramer, Charles J., to Xerox Corporation. Optical scanner using plane linear diffraction gratings on a rotating spinner. 4,289,371, Cl. 350-3.710.

Kramer, Daniel E. Segmented door for enclosure. 4,289,362, Cl. 312-138.00R.

Kraus, Franz: *See*—
Schnee, Rolf; Kraus, Franz; Kiel, Friedrich; Kliem, Helmut; Krick, Wolfgang; and Landgraf, Herbert, 4,290,142, Cl. 455-3.000.
Krause, Bernd, to Xomox Corporation. Bidirectional axially pliant pressure assisted seat for a valve. 4,289,296, Cl. 251-306.000.
Krautkramer-Branson, Inc.: *See*—
Prause, Reinhard; and Schlengermann, Udo, 4,289,033, Cl. 73-622.000.
Krebser, John P., to French Oil Mill Machinery Company, The. Spacers for cage presses. 4,289,065, Cl. 100-129.000.
Kreipe, T. Frederick: *See*—
Wall, Fraser M.; Kitzen, Maurice R.; and Kreipe, T. Frederick, 4,289,475, Cl. 431-11.000.
Kremer, Victor: *See*—
Legille, Edouard; and Kremer, Victor, 4,290,067, Cl. 343-12.00R.
Krick, Wolfgang: *See*—
Schnee, Rolf; Kraus, Franz; Kiel, Friedrich; Kliem, Helmut; Krick, Wolfgang; and Landgraf, Herbert, 4,290,142, Cl. 455-3.000.
Kristof, Mark J., to Whirlpool Corporation. Energy transmission and distribution system for a microwave oven. 4,289,945, Cl. 219-10.55F.
Krohn, David A., to EOTec Corporation. Low loss optical fibers. 4,289,516, Cl. 65-3.00A.
Kruger, Hans-Rudolf, to Schering Aktiengesellschaft. Method for production of acylhydrazones of formyl-acetic acid ester. 4,289,897, Cl. 560-159.000.
Kubilos, Charles A., to Abex Corporation. Pressure compensated pump. 4,289,452, Cl. 417-222.000.
Kubo, Masayoshi; Nakanishi, Michio; and Kimura, Mamoru, to Daicel Chemical Industries, Ltd. Process for producing lactone polyesters. 4,289,873, Cl. 528-357.000.
Kubota, Shigeo; Ishihara, Tadao; and Kikuchi, Masahiro, to Sony Corporation. Apparatus for measuring a gradient of a surface. 4,289,400, Cl. 356-376.000.
Kuc, Henry, to Peerless Pump Division, Indian Head, Inc. Pump shaft closure. 4,289,317, Cl. 277-1.000.
Kuchman, Michael J.: *See*—
Kleiner, Fredric; Roy, Pradip K.; and Kuchman, Michael J., 4,289,794, Cl. 426-660.000.
Kuenzly, John D.: *See*—
United States of America, National Aeronautics and Space Administration; and Kuenzly, John D., 4,288,982, Cl. 60-200.00R.
Kuhla, Donald E.: *See*—
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,289,704, Cl. 260-345.80R.
Kuhlmann, Robert: *See*—
Nauroth, Peter; Kuhlmann, Robert; and Turk, Gunter, 4,289,681, Cl. 260-37.0SB.
Kuhn, Max: *See*—
Traber, Rene P.; Kuhn, Max; Hofmann, Hans; and Harri, Eugen, 4,289,851, Cl. 435-71.000.
Kuhn S. A.: *See*—
Rostoucher, Guy, 4,288,972, Cl. 56-370.000.
Kuhnel, Roland: *See*—
Friesen, Eckart; Thogersen, Hans P.; and Kuhnel, Roland, 4,288,997, Cl. 62-434.000.
Kullander, Jan O.: *See*—
Andersson, Olof I.; and Kullander, Jan O., 4,289,363, Cl. 312-257.00R.
Kullmann, Dieter, to Siemens Aktiengesellschaft. Coolant connecting head for an electric machine with a superconducting rotor winding. 4,289,986, Cl. 310-61.000.
Kume, Kazunari; and Ohno, Hideshi, to Citizen Watch Company Limited. Electronic timepiece. 4,290,131, Cl. 368-71.000.
Kunjumon, Varughese. Variably supported container. 4,289,292, Cl. 248-333.000.
Kuper, Walter. Snow removal bar for the snow removal plate of a snow plow. 4,288,932, Cl. 37-42.0VL.
Kupriyanovich, Leonid I. Method for controlling functional state of central nervous system and device for effecting same. 4,289,121, Cl. 128-1.00C.
Kuptsov, Nikolai F.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,289,731, Cl. 422-206.000.
Kuraray Co., Ltd.: *See*—
Okabe, Susumu; Omura, Yoshiaki; Ninagawa, Yoichi; and Fujita, Yoshiji, 4,289,786, Cl. 424-312.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Hotta, Tetsuya; Enomoto, Satoru; Yoshikumi, Chikao; Ohara, Minoru; and Ueno, Saburo, 4,289,688, Cl. 260-112.00R.
Kurmeier, Hans-Adolf: *See*—
Schacht, Erich; Kurmeier, Hans-Adolf; Gante, Joachim; Lissner, Reinhard; Melzer, Guido; and Orth, Dieter, 4,289,774, Cl. 424-250.000.
Kurta Corporation: *See*—
Rodgers, James L., 4,289,927, Cl. 178-19.000.
Kurth, Wilfried, to Jagenberg-Werke. Apparatus for scanning the markings on bottle necks. 4,289,961, Cl. 250-223.00B.
Kushida, Naoto: *See*—
Inagawa, Takashi; Kushida, Naoto; Sekiguchi, Akira; Ikeda, Matujiro; Sugawara, Hidetoshi; and Naito, Kunio, 4,290,037, Cl. 335-202.000.
Kuyt, Gerard: *See*—
Franken, Adrianus J. J.; Khoe, Giok D.; Kuyt, Gerard; Van Leest, Johannes H. F. M.; Nicia, Antonius J. A.; Potters, Cornelis J. T.; and Smulders, Hendricus F. G., 4,289,374, Cl. 350-96.200.
Kuzmin, Ivan V.: *See*—
Stakhov, Alexei P.; Kozak, Andrei A.; Solyanichenko, Nikolai A.; Kuzmin, Ivan V.; and Azarov, Alexei D., 4,290,051, Cl. 340-347.0DD.
Kyriakou, George S. Cigarette protector. 4,289,149, Cl. 131-175.000.
La Crosse Cooler Company: *See*—
Spring, Carl E., 4,289,254, Cl. 221-295.000.
La Telemecanique Electrique: *See*—
Neyroud, Jean; and Ollivier, Francois, 4,289,957, Cl. 235-462.000.
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Haker, Rolf; Fuhrer, Heinz-Georg; van Rijckevorsel, Rainer; Ruhl, Werner; and Thiery, Joachim, 4,290,113, Cl. 364-900.000.
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Fogelberg, Clement V.; and Romig, Joseph H., 4,289,816, Cl. 428-35.000.
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Capuano, Terry D., 4,289,181, Cl. 411-187.000.
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Gustafson, Leon D.; and Mielke, Wayne C., 4,289,793, Cl. 426-491.000.
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Last, Anthony G. M., to Imperial Chemical Industries Limited. Polyolefin films. 4,289,831, Cl. 428-515.000.
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Latowski, Anthony A.; and Grib, William P., to Koppers Company, Inc. Sinter machine-pelletizing machine wear and baffle plate for pallet side plate. 4,289,485, Cl. 432-245.000.
Latta, John S., Jr. Light detection, signaling and speed measurement system. 4,290,047, Cl. 340-134.000.
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Kagiwada, Reynold S.; Yen, Kuo-hsiung; and Lau, Kei-fung, 4,290,033, Cl. 333-141.000.
Laurent, Henry; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, to Schering Aktiengesellschaft. Novel corticoids, the preparation thereof and the use thereof. 4,289,763, Cl. 424-243.000.
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Johnson, Larry K.; and Gates, Kenneth L., 4,288,887, Cl. 16-105.000.
Lazarus, Stanley D.: *See*—
Rowan, Hugh H.; Mueller, Max B.; and Lazarus, Stanley D., 4,289,871, Cl. 528-309.000.

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Wildman, Samuel G.; and Sheen, Shuh J., 4,289,147, Cl. 131-290.000.

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Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,289,545, Cl. 148-6.300.

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Lecourt, Guy B. E.; and Portalier, Claude L. L., to Societe Nationale Industrielle et Aerospatiale. Method for making pipe of fabric impregnated with resin. 4,289,168, Cl. 138-109.000.

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LeGrand, Jesse S., to International Telephone and Telegraph Corporation. High speed phase locked loop frequency synthesizer. 4,290,028, Cl. 331-1.00A.

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Berte, Marc; and Legrand, Pierre, 4,290,012, Cl. 324-71.0EB.

LeMay, Christopher A. G., to EMI Limited. Radiography. 4,289,968, Cl. 250-445.00T.

Lemelson, Jerome H. Rechargeable electric battery system. 4,289,836, Cl. 429-61.000.

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Sterman, Albert P.; Gay, Charles H., Jr.; Tegarden, Frederick W.; and Lenahan, Dean T., 4,289,447, Cl. 415-200.000.

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Hooper, David C.; Johnson, George A.; and Peter, Donald, 4,289,641, Cl. 252-96.000.

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Agassi, Abraham; and Levy, Amnon, 4,288,950, Cl. 52-79.120.

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Lewis, Donald F., deceased (by Lewis, Sheri, administrator). Device to indicate solar exposure. 4,288,922, Cl. 33-1.0DD.

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Hornbaker, Edwin D.; and Li, Hsueh M., 4,289,862, Cl. 525-538.000.

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Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.

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Streckenbach, Wulf-Christian, 4,290,029, Cl. 331-1.00A.

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Pearce, Warren, Jr.; Schramme, Stephan H.; Lightner, John L.; and McGee, Joseph A., 4,289,924, Cl. 174-152.00G.

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Goodman, Richard M.; and Lim, Sim K., 4,289,613, Cl. 209-167.000.

Lindberg, Ernst R., to Svedala-Arbra AB. Method and apparatus for the reversal or replacement of hammers in hammer mills. 4,288,904, Cl. 29-426.300.

Linn, Bruce O.: *See*—
Bochis, Richard J.; Fisher, Michael H.; and Linn, Bruce O., 4,289,784, Cl. 424-274.000.

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Schacht, Erich; Kurmeier, Hans-Adolf; Gante, Joachim; Lissner, Reinhard; Melzer, Guido; and Orth, Dieter, 4,289,774, Cl. 424-250.000.

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Noraberg, John, 4,289,105, Cl. 123-500.000.

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Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.

LITE-A-GUIDE, Inc.: *See*—
Thompson, Tom; and Hirschberg, Kenneth A., 4,290,093, Cl. 362-98.000.

Litrap, Jay J. Gold pan and classifier. 4,289,241, Cl. 209-44.000.

Litton Systems, Inc.: *See*—
Spencer, David R.; and Zuckerman, Leonard, 4,290,086, Cl. 358-293.000.

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Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; Martone, James F.; and Sabad, Joseph J., 4,289,666, Cl. 260-23.00H.
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Long, Lennart E.; Steele, Roger K.; Coleman, David F.; and Gustafson, Ralph A., to United States of America, Transportation. Longitudinal rail profilometer. 4,288,926, Cl. 33-174.00P.

Longuet, Andre, to Fives-Cail Babcock. Apparatus for contacting solids with a liquid. 4,289,734, Cl. 422-272.000.

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Bugaut, Andree; Grollier, Jean-Francois; and Vandenboosche, Jean-Jacques, 4,289,495, Cl. 8-406.000.

Lorenzen, Kenneth: *See*—
Gary, Norman E.; and Lorenzen, Kenneth, 4,288,880, Cl. 6-12.00R.

Lorenzi, Donald E., to Magnaflux Corporation. Method and apparatus for establishing magnetization levels for magnetic particle testing or the like. 4,290,016, Cl. 324-216.000.

Lougheed, Robert M.: *See*—
Sternberg, Stanley R.; Lougheed, Robert M.; and Dargel, William O., 4,290,049, Cl. 340-146.3MA.

Lowdenslager, John; and Zatsky, Norman C., to Timex Corporation. Digital frequency trimmed electronic timepiece. 4,290,130, Cl. 368-200.000.

Lubrizol Corporation, The: *See—*
Schroeck, Calvin W., 4,289,635, Cl. 252-32.70E.

Lucas Industries Limited: *See—*
Heibel, Helmut, 4,289,217, Cl. 188-73.380.

Lugscheider, Walter: *See—*
Wallner, Felix; and Lugscheider, Walter, 4,289,541, Cl. 134-7.000.

Luk, Kong; Clayton, John P.; and Rogers, Norman H., to Beecham Group Limited. Antibacterial compounds. 4,289,779, Cl. 424-263.000.

Lukasavage, William J.: *See—*
Denkewalter, Robert G.; Kolc, Jaroslav; and Lukasavage, William J., 4,289,872, Cl. 528-328.000.

Luke, Donald A.: *See—*
Worthington, Ralph E.; Luke, Donald A.; and Reese, Stanton L., 4,289,609, Cl. 209-11.000.

Lumen, Karl L. G., to Sandvik Aktiebolag. Rock drill bit. 4,289,211, Cl. 175-410.000.

Lupertz, Hans-Henning; and Berisch, Volker, to ITT Industries, Inc. Brake force regulator for a motorcycle hydraulic brake system. 4,289,359, Cl. 303-6.00C.

Lustig, Leopold P.; and Yaron, Anselm, to Lustig, Leopold Paul. Tools for drilling, reaming and the like with simultaneous angular and linear oscillatory motions. 4,289,849, Cl. 433-123.000.

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Luxemburg, S. Roy. Compositions and process for extension of the useful life of machine elements. 4,289,631, Cl. 252-8.50B.

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Economy, James; Lyerla, James R.; and Pederson, Lester A., 4,289,573, Cl. 156-643.000.

Lyman, Lawrence C., to Industronics, Inc. Car bottom furnace. 4,289,484, Cl. 432-241.000.

Lynch, Thomas J.: *See—*
Hill, Robert W.; Kehl, William L.; and Lynch, Thomas J., 4,289,863, Cl. 526-106.000.

Lynn, Robert W., to Becton, Dickinson and Company. Container closure assembly having intermediate positioning means. 4,289,248, Cl. 215-330.000.

Lytwyn, Ann: *See—*
Baughman, D. Joseph; and Lytwyn, Ann, 4,289,498, Cl. 23-230.00B.

M P Food Technology, Inc.: *See—*
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Cajigas, Stanley D., 4,289,789, Cl. 426-61.000.

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MacConnell, John G.: *See—*
Mrozik, Helmut H.; MacConnell, John G.; and Kempf, August J., 4,289,760, Cl. 424-181.000.

MacGregor, Francis W., to Cosco Industries, Inc. Rubber stamp. 4,289,070, Cl. 101-327.000.

Mack, Mark P., to Conoco, Inc. Method for producing solutions of drag reducing substances. 4,289,679, Cl. 260-33.6PQ.

Mack, Michael E.: *See—*
Itzkan, Irving; Kent, Herbert P.; Mack, Michael E.; and Morton, Richard G., 4,289,397, Cl. 356-5.000.

MacLeane, Johannes: *See—*
Stanwood, Jay W.; Clarke, William A.; and MacLeane, Johannes, 4,289,557, Cl. 156-171.000.

Macur, George J.: *See—*
Alpaugh, Warren A.; Macur, George J.; and Sharkness, James E., 4,289,594, Cl. 204-158.00R.

Maddox, William J., to RCA Corporation. Light transmission measurement method. 4,289,406, Cl. 356-429.000.

Maeder, Edward G.; and Tovey, John M., to National Can Corporation. Double action domer assembly. 4,289,014, Cl. 72-348.000.

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Lorenzi, Donald E., 4,290,016, Cl. 324-216.000.

Magnani, Michel; and Moulin, Michel, to S.A. Andre Boet. Electrical apparatus and method for electrically simulating a noise. 4,290,054, Cl. 340-384.00E.

Mahieu, Claude; and Papantoniou, Christos, to Societe Anonyme dite: L'Oreal. Cosmetic compositions containing N-alkylacrylamide or N-alkylmethacrylamide based copolymers. 4,289,752, Cl. 424-47.000.

Mahncke, Jurgen; Weigele, Hans; and Hotz, Dieter, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Bridge laying apparatus. 4,288,881, Cl. 14-2.400.

Maier, Roland: *See—*
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,289,775, Cl. 424-251.000.

Maiocchi, Luigi: *See—*
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Makovec, Donald J., to Phillips Petroleum Co. Temperature control for a reactor. 4,290,110, Cl. 364-500.000.

Malcolm, David H., to Speeflo Manufacturing Corporation. Spray gun having self-contained low voltage and high voltage power supplies. 4,290,091, Cl. 361-228.000.

Maliszewski, Leonard A., to Continental Group, Inc., The. Non-detach easy opening container unit. 4,289,251, Cl. 220-269.000.

Mallard, John R.: *See—*
Hutchison, James M. S.; Mallard, John R.; and Sutherland, Robert J., 4,290,019, Cl. 324-311.000.

Malm, Robert, to Northrop Corporation. Combined coherent frequency and phase shift keying modulation system. 4,290,140, Cl. 375-46.000.

Maly, Hans-Peter, to Robert Bosch GmbH. Circuit arrangement for the transmission of digital data. 4,289,976, Cl. 307-247.00R.

Mandell, Kenneth H. Clamp. 4,289,417, Cl. 403-218.000.

Mangione, Joseph F.: *See—*
Schneider, John R.; and Mangione, Joseph F., 4,289,615, Cl. 210-91.000.

Mansukhani, Ishwar R., to American Can Company. Opaque jet ink printing method and composition. 4,290,072, Cl. 346-1.100.

Marathon Electric Manufacturing Corp.: *See—*
Ebert, Robert W., 4,289,923, Cl. 174-65.00G.
Schibline, Patrick J., 4,289,989, Cl. 310-261.000.

Marcelin, George: *See—*
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Mardirossian, John H., to Levinger, Paul. Buckle. 4,288,892, Cl. 24-206.00B.

Margant, Gerard: *See—*
Declerco, Marc A.; and Margant, Gerard, 4,289,448, Cl. 416-140.000.

Marginean, Barry L.; and Hookway, Warren A., Jr., to Labelon Corporation. Heat sensitive coating. 4,289,535, Cl. 106-19.000.

Margotte, Dieter: *See—*
Druschke, Frank; Margotte, Dieter; Tresper, Erhard; Bottenbruch, Ludwig; Cohnen, Wolfgang; and Hucks, Uwe, 4,289,685, Cl. 260-45.70S.

Marks, Dale H. Bisexual electrical connector. 4,289,366, Cl. 339-49.00B.

Markusch, Peter: *See—*
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Maroszek, Raymond V., to American Can Company. Article carrier. 4,289,266, Cl. 229-28.0BC.

Marshall, Trevor J., Jr.; and Dworkin, Darryl R., to CBS Inc. Riding toy with sound effects. 4,289,307, Cl. 272-52.500.

Marti, Bernard; Poignet, Alain; Savary, Jean-Yves; and Brusq, Roger, to Etablissement Public de Diffusion dit Telediffusion de France. System for digital transmission and text display. 4,290,062, Cl. 340-721.000.

Martin, Charles W.: *See—*
Pearce, Roscoe L.; and Martin, Charles W., 4,289,738, Cl. 423-228.000.

Martin, Eugene R., to SWS Silicones Corporation. Organofunctional polysiloxane polymers and a method for preparing the same. 4,289,867, Cl. 528-12.000.

Martin, Patrick H., to Dow Chemical Company, The. Method of water-solubilizing high performance polyether epoxide resins, the solubilized resins and thermoset, hydrophobic coatings derived therefrom. 4,289,812, Cl. 427-379.000.

Martone, James F.: *See—*
Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; Martone, James F.; and Sabad, Joseph J., 4,289,666, Cl. 260-23.00H.

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Maryland Cup Corporation: *See—*
Weinstein, David, 4,289,791, Cl. 426-139.000.

Masaki, Shinzaburo: *See—*
Fukasawa, Akira; Masaki, Shinzaburo; and Serizawa, Norio, 4,289,706, Cl. 260-369.000.

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Maska, Rudolf: *See—*
Christenson, Roger M.; Maska, Rudolf; Dowbenko, Rostyslawa; and Hockswender, Thomas R., 4,289,674, Cl. 260-29.6NR.

Mason, Randy D. F.; and Vuletich, William. Ankle-foot orthosis. 4,289,122, Cl. 128-80.00E.

Massachusetts Institute of Technology: *See—*
Haggerty, John S., 4,289,952, Cl. 219-121.00L.
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., 4,290,118, Cl. 365-183.000.

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Bailey, Alfred J., 4,289,256, Cl. 222-52.000.

Massion, Robert J., to Signode Corporation. Positive sealing assembly for hand operated strapping tool. 4,289,174, Cl. 140-93.400.

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Matthews, Lloyd E.: *See*—
Beaumont, Gregory J.; and Matthews, Lloyd E., 4,289,994, Cl. 315-371.000.

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Gray, Lorin S., III; Mattor, John A.; Millard, Ben; and Ward, Franklin J., 4,289,821, Cl. 428-172.000.

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McArthur, Dennis P., to Union Oil Company of California. Process for catalytically cracking metals-containing hydrocarbon feedstocks. 4,289,608, Cl. 208-121.000.

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McKee, Edward A. Disc brake piston depressing tool. 4,288,899, Cl. 29-256.000.

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McLaughlin, Richard J. Touch sensitive electric switch. 4,289,980, Cl. 307-308.000.

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McMurtry, David R., to Rolls-Royce Limited; and Renishaw Electrical Limited. Probe for use in measuring apparatus. 4,288,925, Cl. 33-174.00L.

McNamara, Thomas J. Heat exchanger. 4,289,197, Cl. 165-115.000.

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Koba, Yoshinori, 4,289,179, Cl. 144-211.000.

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Barrow, Kevin D.; and Mellows, Graham, 4,289,703, Cl. 260-345.80R.

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Sterling, Larry D.; and Melvin, Wilbert, Jr., 4,288,999, Cl. 68-13.00R.

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Bochis, Richard J.; Fisher, Michael H.; and Linn, Bruce O., 4,289,784, Cl. 424-274.000.
Mrozik, Helmut H.; MacConnell, John G.; and Kempf, August J., 4,289,760, Cl. 424-181.000.
Windheuser, John J., 4,289,751, Cl. 424-35.000.

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Harders, Hans-Dieter; and Helger, Roland, 4,289,649, Cl. 252-408.000.
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Calder, G. Vincent; and Mercurio, Andrew, 4,289,678, Cl. 260-33.6UA.

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Mikel, Steve A.; and Blomquist, Alfred P., to Chrysler Corporation. Lock-up system for torque converter. 4,289,048, Cl. 74-733.000.
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Miller, John F. Self aligning carrier head and truck assembly. 4,289,076, Cl. 105-163.00R.
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Miller, Wayne R.: *See*—
Latham, David D.; Von Fumetti, Cyril W.; and Miller, Wayne R., 4,289,096, Cl. 123-198.00E.
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Soch, Fredrich A., 4,289,892, Cl. 560-26.000.
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Minshull, John F.; and Brazdil, Pavel, to International Business Machines Corp. Method and means for preserving original continuity/-discontinuity among same colored pel clusters upon array compression. 4,290,084, Cl. 358-260.000.
Mitchell, Peter J. D. Rakes. 4,289,344, Cl. 294-2.000.
Mitrofanov, Evgeny S.; Ivanov, Boris G.; Ivanov, Nikolai A.; Kaljunov, Gennady A.; and Khinich, Isaak Y. Crusher bowl clamping device. 4,289,280, Cl. 241-207.000.
Mitschke, Karl-Heinz; and Niederprum, Hans, to Bayer Aktiengesellschaft. 1,1-Difluoro-2-chloroethylene as aerosol propellant. 4,289,646, Cl. 252-305.000.
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Ikeda, Hideo; Tsuchiya, Hideshi; and Okada, Masaru, 4,289,937, Cl. 179-119.00R.
Mitsubishi Gas Chemical Company, Inc.: *See*—
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Mitsui Toatsu Chemicals, Incorporated: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,289,699, Cl. 260-326.5FM.
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Saito, Hirokazu; Suzuki, Keiichi; Shimizu, Masayuki; and Miyahara, Junji, 4,289,733, Cl. 422-227.000.
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Herrington, F. John, Jr., 4,289,727, Cl. 264-514.000.
Kokotailo, George T., 4,289,607, Cl. 208-120.000.
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Holzwarth, Robert W., 4,289,347, Cl. 296-107.000.
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Liljedahl, Gregory N.; and Moffat, Bruce K., 4,288,979, Cl. 60-39.120.
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Woolston, A. Brent; and Evans, Donald J., 4,289,052, Cl. 83-26.000.
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Monk, Robert J.; and Loesche, Franz W. Fluid energy convertor. 4,289,444, Cl. 415-3.000.
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D'Amico, John J., 4,289,886, Cl. 548-165.000.
Dyroff, David R.; Graf, Gary F.; Kim, Keun Y.; and Suchanek, Walton F., Jr., 4,289,753, Cl. 424-48.000.
Gomez, I. Luis; and Cole, Robert, 4,289,664, Cl. 260-19.00R.
Tolbert, William R.; Hitt, Mary M.; and Feder, Joseph, 4,289,854, Cl. 435-241.000.
Van Eenam, Donald N., 4,289,864, Cl. 526-235.000.
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Overman, Sherman A., 4,289,289, Cl. 248-235.000.
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Montgomery, J. L. Fence arrangement. 4,289,302, Cl. 256-19.000.
Mookherjee, Braja D.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,289,145, Cl. 131-276.000.
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Moore, Lewis F.; and Price, George M., to Frymaster Corporation, The. Cooking system. 4,289,477, Cl. 431-171.000.
Moore, Robert E.: *See*—
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Morimoto, Yoshinori, to Ryobi Ltd. Leg and saddle of fishing reel. 4,289,283, Cl. 242-84.20R.
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Morse, Timothy C., to Centronics Data Computer Corp. Method and apparatus for operating a printer. 4,290,116, Cl. 364-900.000.
Morton, Richard G.: *See*—
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Moschetto, Rudolph. Self-adjusting variable speed idler pulley. 4,289,489, Cl. 474-52.000.
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Basham, Edward R.; and Mosely, L. Max, 4,289,024, Cl. 73-151.000.
Moser, Peter, to Ciba-Geigy Corporation. Cationic oxazine dyes. 4,289,880, Cl. 544-103.000.
Mostek Corporation: *See*—
Eaton, Sargent S., Jr., 4,289,973, Cl. 307-448.000.
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Butler, Walker, 4,290,066, Cl. 343-17.10R.
Smith, Stephen L., 4,289,982, Cl. 307-463.000.
Mott, James D., to Hydril Company. Well safety system method and apparatus. 4,289,205, Cl. 166-315.000.
Mougin, Georges L., to I.T.I. Limited. Protective skirt for an iceberg. 4,289,423, Cl. 405-61.000.
Moulding, Kenneth W.; and Wilson, Gordon A., to U.S. Philips Corporation. Filter circuit arrangement. 4,290,036, Cl. 333-215.000.

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Pridham, Roger G.; and Mucci, Ronald A., 4,290,127, Cl. 367-123.000.

Muccitelli, John A., to Betz Laboratories, Inc. Hydroquinone and mu-amine compositions. 4,289,645, Cl. 252-178.000.

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Mueller, Max B.: *See—*
Rowan, Hugh H.; Mueller, Max B.; and Lazarus, Stanley D., 4,289,871, Cl. 528-309.000.

Mueller, Rene E., to Ergo Instruments, Inc. Surgical power tool. 4,289,131, Cl. 128-303.00R.

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Mukhin, Viktor M.: *See—*
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Mukhina, Tamara N.: *See—*
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Muldrey, Michael J.: *See—*
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Muller, Hans-Ueli: *See—*
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Muller, Harold, to Burroughs Corporation. Transistorized master slave flip-flop having threshold offsets generated by circuit size variations. 4,289,979, Cl. 307-272.00A.

Muller, Paul A.; and Muster, Hans, to Celfil Company Establishment. Material web for the manufacture of filter rods for tobacco products and apparatus and process for producing such web. 4,289,725, Cl. 264-287.000.

Muller, Paul F.: *See—*
Woehrle, Patrick; Habock, Adolf; and Muller, Paul F., 4,290,108, Cl. 364-480.000.

Muller, Reinhold: *See—*
Janner, Karl; Gregorius, Klaus; and Muller, Reinhold, 4,289,592, Cl. 204-157.10R.

Mummenthey, Hans-Dieter: *See—*
Ritz, Jurgen; Hotze, Hermann; and Mummenthey, Hans-Dieter, 4,289,866, Cl. 526-320.000.

Munday, Theodore F.: *See—*
Chiang, John S.; Munday, Theodore F.; and Ilardi, Joseph M., 4,289,739, Cl. 423-306.000.

Munekata, Kenichi; Fujita, Michio; and Hattori, Yasuhiro, to Toyoda Koki Kabushiki Kaisha. Rest apparatus. 4,288,945, Cl. 51-238.00S.

Murakawa, Takeyoshi; Sakamoto, Tetsuo; and Oka, Yutaka, to Nippon Electric Glass Company, Limited. Work tables in apparatus for blowing hollow glass articles. 4,289,523, Cl. 65-172.000.

Murase, Fujio; Matsumoto, Hidenosuke; Fujieda, Hiroshi; Takano, Teruhisa; and Imasu, Kenichiro, to Matsushita Electric Industrial Co., Ltd. Temperature control apparatus. 4,289,272, Cl. 236-91.00D.

Murdock, John B. Roofing or siding article. 4,288,959, Cl. 52-518.000.

Murer, Mario V., to Ateliers de Constructions Mecaniques Armand Colinet. Machine for mechanically opening and emptying bags which may contain a toxic product. 4,289,438, Cl. 414-412.000.

Murphy, H. Joseph: *See—*
Elston, Colin; Hoffman, Herbert A.; and Murphy, H. Joseph, 4,289,580, Cl. 162-109.000.

Murphy, Shirley D. Process and apparatus for heat laminating film to a substrate. 4,289,559, Cl. 156-238.000.

Murray, Pat L.: *See—*
Koehler, Charles E.; McClellan, Thomas R.; and Murray, Pat L., 4,289,858, Cl. 521-131.000.

Muschelknautz, Edgar: *See—*
Herold, Heiko; Herold, Richard; Klee, Rudolf J.; and Muschelknautz, Edgar, 4,288,893, Cl. 28-266.000.

Muster, Hans: *See—*
Muller, Paul A.; and Muster, Hans, 4,289,725, Cl. 264-287.000.

Muzzell, Stephen E., to Gulf & Western Manufacturing Company. Seat construction. 4,289,304, Cl. 267-112.000.

Myers, George D.; and Walters, Paul W., to Ashland Oil, Inc. Biased degasser for fluidized bed outlet. 4,289,729, Cl. 422-144.000.

Myers, John H.: *See—*
Ganz, Robert H.; and Myers, John H., 4,289,236, Cl. 206-432.000.

Myers, John W., to Phillips Petroleum Company. Catalytic isomerization of an internal double bond aliphatic mono-olefin to produce terminal bond olefin. 4,289,919, Cl. 585-664.000.

Myllymaki, Richard A., to United Technologies Corporation. Injection molding thermoplastic patterns having ceramic cores. 4,289,191, Cl. 164-45.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Improved rear hub chair protector. 4,289,490, Cl. 474-144.000.

Nagl, Gary J.: *See—*
Hardison, Leslie C.; Eng, Joseph P.; and Nagl, Gary J., 4,289,505, Cl. 55-59.000.

Naito, Kunio: *See—*
Inagawa, Takashi; Kushida, Naoto; Sekiguchi, Akira; Ikeda, Matujiro; Sugawara, Hidetoshi; and Naito, Kunio, 4,290,037, Cl. 335-202.000.

Nakagawa, Kazuyuki: *See—*
Tominaga, Michiaki; Tone, Hitoshi; and Nakagawa, Kazuyuki, 4,289,883, Cl. 546-158.000.

Nakagawa, Tamotsu: *See—*
Takenoya, Hideaki; Watanabe, Kazuo; Nakagawa, Tamotsu; and Tonomura, Yoshinobu, 4,289,087, Cl. 112-254.000.

Nakahara, Masao: *See—*
Mizuno, Ichiro; and Nakahara, Masao, 4,288,924, Cl. 33-147.00F.

Nakajima, Yoshio: *See—*
Takayama, Shuichi; Tsuboshima, Kosaku; Nakajima, Yoshio; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,289,959, Cl. 250-201.000.

Nakamura, Ichiro, to Hitachi, Ltd. Hydraulic driving device. 4,289,063, Cl. 91-306.000.

Nakamura, Noboru: *See—*
Yamanaka, Junichi; Nakamura, Noboru; Fujiki, Hirokazu; and Miyaji, Yoshimori, 4,290,038, Cl. 335-214.000.

Nakamura, Norihiko: *See—*
Ito, Takaaki; and Nakamura, Norihiko, 4,289,715, Cl. 261-44.00C.

Nakamura, Shinji; and Yamakawa, Katsuyoshi, to Japan Air Lines Co., Ltd. Construction of truck for attractive type magnetically levitated vehicle. 4,289,074, Cl. 104-284.000.

Nakanishi, Kiyoshi; Ito, Kazuhiko; Okumura, Takeshi; Iezuka, Isamu; and Yasukawa, Masao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,289,099, Cl. 123-307.000.

Nakanishi, Michio: *See—*
Kubo, Masayoshi; Nakanishi, Michio; and Kimura, Mamoru, 4,289,873, Cl. 528-357.000.

Nakanishi, Mikimaro, to Tomoe Technical Research Company. Butterfly valve. 4,289,297, Cl. 251-306.000.

Nakano, Nobuo: *See—*
Tanaka, Osamu; Nakano, Nobuo; and Fukui, Toyoaki, 4,290,070, Cl. 343-788.000.

Nakayama, Yoshiki; Yazawa, Chihiro; and Yamanashi, Koji, to Ihara Chemical Industry Co., Ltd. Process for producing p-chloroalkylbenzene. 4,289,916, Cl. 570-209.000.

Nakrokhin, Vladimir G.: *See—*
Katunin, Vladimir M.; and Nakrokhin, Vladimir G., 4,289,974, Cl. 307-527.000.

Namba, Takamasa; Yanagawa, Hidekata; Fujimoto, Nobuo; Mori, Takehiko; and Yamada, Takayoshi, to Hitachi, Ltd.; and Japan Air Lines Company Limited. Apparatus for feeding a strip of continuous forms. 4,289,263, Cl. 226-196.000.

Napp Systems (USA), Inc.: *See—*
Hailman, Robert W.; Kimoto, Koichi; and Okai, Sakuo, 4,289,071, Cl. 101-395.000.

Nartron Corporation: *See—*
Bull, David W., 4,290,092, Cl. 362-61.000.

National Can Corporation: *See—*
Maeder, Edward G.; and Tovey, John M., 4,289,014, Cl. 72-348.000.

National Research Development Corporation: *See—*
Hutchison, James M. S.; Mallard, John R.; and Sutherland, Robert J., 4,290,019, Cl. 324-311.000.
Peel, John L.; and Waites, William M., 4,289,728, Cl. 422-24.000.

National Research Institute for Metals: *See—*
Gunji, Koki; and Dan, Takehiro, 4,289,533, Cl. 75-138.000.

National Semiconductor Corporation: *See—*
Lewis, Steven M., 4,289,451, Cl. 417-40.000.

Nauroth, Peter; Kuhlmann, Robert; and Turk, Gunter, to Deutsch Gold- und Silber-Scheideanstalt Vormals Roessler. Boron containing precipitated silica. 4,289,681, Cl. 260-37.0SB.

Neeley, William E.; and Moose, Terrell F. Proportioning pump. 4,289,459, Cl. 417-475.000.

Nehring, John R., to C. R. Bard, Inc. Suction control apparatus. 4,289,158, Cl. 137-205.000.

Neiman S.A.: *See—*
Bemm, Wulf W.; and Weber, Gunter, 4,289,342, Cl. 292-49.000.

Nelson, Byron G. Breathing apparatus stabilizer. 4,289,127, Cl. 128-207.140.

Nelson, Paul M., to Wilson Industries, Inc. Tongs having torque indicator thereon. 4,289,021, Cl. 73-862.250.

Nelson, Richard S., to United Kingdom Atomic Energy Authority. Fluid treatment devices. 4,289,657, Cl. 252-477.00R.

Nemeth, Edwin A., to Nemeth, Edwin A. Folding tricycle wheel for folding golf cart. 4,289,324, Cl. 280-38.000.

Nemoto, Kuniichi. Sound effects producer. 4,290,053, Cl. 340-384.00E.

Nessi, Aurindo, to Innocenti Santeustacchio S.p.A. Device for inserting and pushing a bar into a press-piercing mill. 4,289,012, Cl. 72-209.000.

Neubert, Terry C., to General Tire & Rubber Company, The. Adhesion of polyamide or polyester cords to rubber. 4,289,683, Cl. 260-38.000.

Neumann, Gerhard: *See*—
Disselbeck, Dieter; Neumann, Gerhard; Ott, Karl-Heinz; Strobel, Gunther; and Zalewski, Edwin, 4,289,627, Cl. 210-702.000.
Neumann, Jurgen, to Hoechst Aktiengesellschaft. Level indicating device. 4,289,026, Cl. 73-290.00R.
New Balance Athletic Shoe, Inc.: *See*—
Norton, Edward J.; and Graham, Kenneth W., 4,288,929, Cl. 36-69.000.
Newton, Derek A.: *See*—
Cocks, Philip J.; and Newton, Derek A., 4,288,906, Cl. 29-526.00R.
Neyroud, Jean; and Ollivier, Francois, to La Telemecanique Electrique. Reading stroke codes. 4,289,957, Cl. 235-462.000.
NGK Spark Plugs Co., Ltd.: *See*—
Mayumi, Kazuhisa; Suzuki, Katsumi; and Tsuboi, Fujio, 4,289,990, Cl. 313-143.000.
NHK Spring Co., Ltd.: *See*—
Urano, Takayuki, 4,289,218, Cl. 188-134.000.
Niagara Machine & Tool Works: *See*—
Proga, Norbert J., 4,289,066, Cl. 100-53.000.
Nicholl, Thomas H. Aerodynamic device. 4,288,942, Cl. 46-74.00D.
Nicia, Antonius J. A.: *See*—
Franken, Adrianus J. J.; Khoe, Giok D.; Kuyt, Gerard; Van Leest, Johannes H. F. M.; Nicia, Antonius J. A.; Potters, Cornelis J. T.; and Smulders, Hendricus F. G., 4,289,374, Cl. 350-96.200.
Nickerson, Harvey R.: *See*—
Press, Irving D.; and Nickerson, Harvey R., 4,289,340, Cl. 285-382.400.
Niederprum, Hans: *See*—
Mitschke, Karl-Heinz; and Niederprum, Hans, 4,289,646, Cl. 252-305.000.
Nielsen, Anker J., Jr., to Omco, Inc. Pick-resistant tubular lock and key for operating the same. 4,289,000, Cl. 70-34.000.
Nijman, John P., to Bunker Ramo Corporation. Method and apparatus for making a crimped, insulation-pierce electrical connection. 4,288,918, Cl. 29-868.000.
Ninagawa, Yoichi: *See*—
Okabe, Susumu; Omura, Yoshiaki; Ninagawa, Yoichi; and Fujita, Yoshiji, 4,289,786, Cl. 424-312.000.
Nippon Electric Co., Ltd.: *See*—
Inagawa, Takashi; Kushida, Naoto; Sekiguchi, Akira; Ikeda, Matujiro; Sugawara, Hidetoshi; and Naito, Kunio, 4,290,037, Cl. 335-202.000.
Kobayashi, Masahisa, 4,289,926, Cl. 178-19.000.
Matsumoto, Masashige; Kobuna, Hideaki; Hiraide, Seiji; and Kawai, Kouichi, 4,289,575, Cl. 156-656.000.
Shoji, Masashi, 4,290,026, Cl. 330-255.000.
Sugimoto, Shigetoki; and Minemura, Kouichi, 4,289,373, Cl. 350-96.160.
Utsumi, Kazuaki; Shohata, Nobuaki; and Ohno, Tomeji, 4,290,041, Cl. 338-21.000.
Nippon Electric Glass Company, Limited: *See*—
Murakawa, Takeyoshi; Sakamoto, Tetsuo; and Oka, Yutaka, 4,289,523, Cl. 65-172.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yokoyama, Kenji, 4,290,024, Cl. 330-85.000.
Nippon Hoso Kyokai: *See*—
Taketoshi, Kazuhisa, 4,289,369, Cl. 339-118.00R.
Nippon Kogaku K.K.: *See*—
Wakabayashi, Hiroshi; and Ohtsubo, Yoshiaki, 4,289,388, Cl. 354-25.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Ando, Ryo; Sato, Kazuyoshi; and Honda, Akira, 4,289,462, Cl. 425-8.000.
Nippon Light Metal Company Limited: *See*—
Akabame, Noboru; and Yoshino, Hitoshi, 4,289,301, Cl. 256-13.100.
Nippon Petrochemical Company, Limited: *See*—
Sato, Atsushi; Shimizu, Isoo; and Gotoh, Masahito, 4,289,918, Cl. 585-422.000.
Nippon Petrochemicals Company, Limited: *See*—
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, 4,289,806, Cl. 427-150.000.
Nippon Steel Corporation: *See*—
Yoshiwara, Seishiro; and Higashiyama, Hirokichi, 4,289,011, Cl. 72-208.000.
Nippondenso Co., Ltd.: *See*—
Kinugawa, Masumi; Omori, Norio; and Sueishi, Motoharu, 4,289,100, Cl. 123-339.000.
Taniguchi, Koichi; Katayama, Minoru; Sangu, Osamu; and Hori, Shinichi, 4,290,109, Cl. 364-481.000.
Nishimura, Satoshi: *See*—
Hayakawa, Masanori; and Nishimura, Satoshi, 4,289,746, Cl. 423-633.000.
Nissan Motor Company, Limited: *See*—
Katsumata, Masaaki; Onoda, Michio; Takagi, Yasuo; and Yoneda, Kenji, 4,289,102, Cl. 123-425.000.
Shioyama, Giichi, 4,289,108, Cl. 123-571.000.
Tamamushi, Masahiro; and Katakura, Kazuo, 4,289,345, Cl. 296-37.160.
Yabuta, Keiichiro, 4,289,329, Cl. 280-804.000.
Nitta, Tomio, to Tokai Seiki Co., Ltd. Cigaret gas lighter. 4,289,478, Cl. 431-344.000.
Nix, Robert J.: *See*—
Crittenden, David E.; Angarola, Barry R.; Nix, Robert J.; and Meier, William A., 4,289,175, Cl. 140-93.400.
Noda Institute for Scientific Research: *See*—
Marumo, Shingo; and Katayama, Masato, 4,289,852, Cl. 435-136.000.
Noell, Godwin L.; and Haynes, Paul L., Jr., to Chandler Evans Inc. Bearing lubrication system for gear pump having clearance between bearing and housing wall for preventing entry of contaminants larger than lubrication passage. 4,289,460, Cl. 418-78.000.
Nolf, Jean-Marie E., to N.V. Raychem S.A. Heat-shrinkable article. 4,289,553, Cl. 156-86.000.
Noll, Klaus; Speicher, Wolfgang; Pedain, Josef; and Schmid, Rosemarie, to Bayer Aktiengesellschaft. Moisture hardening one-component lacquers and a process for coating leather. 4,289,827, Cl. 428-423.400.
Nomura, Masaaki: *See*—
Takada, Shigetaka; Nomura, Masaaki; and Itoh, Manabu, 4,289,104, Cl. 123-471.000.
Nomura, Yoshihisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid reservoir for brake master cylinder. 4,289,162, Cl. 137-572.000.
Noraberg, John, to List, Hans. Fuel injection pump for a compression-ignition engine. 4,289,105, Cl. 123-500.000.
Norberg, Helmut; and Kinzel, Richard, to Robert Bosch GmbH. Device for controlling preliminary injection. 4,289,098, Cl. 123-299.000.
Nordenstrom, Bjorn; and Olsson, Jerker, to Tekniska Rontgencentralen AB. Apparatus for destroying a selected part of biological tissue. 4,289,135, Cl. 128-419.00R.
Norel, Guy; and Desbrandes, Robert, to Institut Francais du Petrole. Sonde with rotatable pad for carrying out logging measurements in a borehole. 4,289,025, Cl. 73-152.000.
Norman, Spencer: *See*—
Badger, Dale R., 4,289,010, Cl. 72-114.000.
North American Utility Construction Corp.: *See*—
Stark, Virgil, 4,289,118, Cl. 126-440.000.
Northrop Corporation: *See*—
Malm, Robert, 4,290,140, Cl. 375-46.000.
Norton, Edward J.; and Graham, Kenneth W., to New Balance Athletic Shoe, Inc. Motion control device for athletic shoe. 4,288,929, Cl. 36-69.000.
Noyes, Walter O.; and Helft, John M. Liquid level alarm for remotely indicating when less than a predetermined quantity of fuel oil remains in a storage tank and method for installing the same. 4,290,059, Cl. 340-624.000.
Nuovo Pignone S.p.A.: *See*—
Traversari, Alessandro; and Giacomelli, Enzo, 4,289,322, Cl. 277-188.00A.
N.V. Optische Industrie "De Oude Delft": *See*—
Baumann, Jacob S.; and Geluk, Ronald J., 4,290,112, Cl. 364-822.000.
N.V. Raychem S.A.: *See*—
Nolf, Jean-Marie E., 4,289,553, Cl. 156-86.000.
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, to Mitsui Toatsu Chemicals, Incorporated. Process for the production of N-(hydroxyphenyl) maleimides. 4,289,699, Cl. 260-326.5FM.
O'Barr, Vernon L. Golf simulating game. 4,289,315, Cl. 273-298.000.
Oberpichler, Gerd: *See*—
Dorpmund, Heinz; and Oberpichler, Gerd, 4,289,044, Cl. 74-688.000.
O'Brien, John W. Automatic ladler. 4,289,259, Cl. 222-590.000.
O'Donnell, Royce L. Simulated log siding. 4,288,954, Cl. 52-233.000.
Ogren, Sven O.: *See*—
Bengtsson, Karl S.; Thorberg, Seth O.; and Ogren, Sven O., 4,289,781, Cl. 424-267.000.
O'Hanlon, Edward J. Heating and cooling of a heavily insulated building through the use only of solar energy. 4,289,115, Cl. 126-430.000.
Ohara, Minoru: *See*—
Hotta, Tetsuya; Enomoto, Satoru; Yoshikumi, Chikao; Ohara, Minoru; and Ueno, Saburo, 4,289,688, Cl. 260-112.00R.
Ohno, Hideshi: *See*—
Kume, Kazunari; and Ohno, Hideshi, 4,290,131, Cl. 368-71.000.
Ohno, Tomeji: *See*—
Utsumi, Kazuaki; Shohata, Nobuaki; and Ohno, Tomeji, 4,290,041, Cl. 338-21.000.
Ohsawa, Kiyotaka: *See*—
Yamamoto, Ryuji; and Ohsawa, Kiyotaka, 4,290,090, Cl. 360-72.100.
Ohtsubo, Yoshiaki: *See*—
Wakabayashi, Hiroshi; and Ohtsubo, Yoshiaki, 4,289,388, Cl. 354-25.000.
Oka, Yutaka: *See*—
Murakawa, Takeyoshi; Sakamoto, Tetsuo; and Oka, Yutaka, 4,289,523, Cl. 65-172.000.
Okabe, Susumu; Omura, Yoshiaki; Ninagawa, Yoichi; and Fujita, Yoshiji, to Kuraray Co., Ltd. Farnesylacetic acid ester derivatives. 4,289,786, Cl. 424-312.000.
Okada, Masaru: *See*—
Ikeda, Hideo; Tsuchiya, Hideshi; and Okada, Masaru, 4,289,937, Cl. 179-119.00R.
Okada, Motohiro, to Honda Giken Kogyo Kabushiki Kaisha. Air bag device for cars. 4,289,327, Cl. 280-737.000.
Okai, Sakuo: *See*—
Hallman, Robert W.; Kimoto, Koichi; and Okai, Sakuo, 4,289,071, Cl. 101-395.000.
Okamura, Kiyohito: *See*—
Yajima, Seishi; Shishido, Toetsu; Okamura, Kiyohito; Kayano, Hideo; Hayashi, Josaburo; and Kobayashi, Hiroshi, 4,289,720, Cl. 264-63.000.

Okawa, Takashi: *See*—
Isogai, Nobuo; Okawa, Takashi; and Wakui, Natsuko, 4,289,911, Cl. 568-396.000.
Okumura, Takeshi: *See*—
Nakanishi, Kiyoshi; Ito, Kazuhiko; Okumura, Takeshi; Iezuka, Isamu; and Yasukawa, Masao, 4,289,099, Cl. 123-307.000.
Okutsu, Hiroyasu, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Wall-hanging type magnetic displaying device. 4,288,936, Cl. 40-426.000.
Olbermann, Joseph M., to Wilkerson Corporation. Modular clamping system for pressure fluid components. 4,289,335, Cl. 285-91.000.
Oldham, Dale R.: *See*—
Hanaford, Donald E.; and Oldham, Dale R., 4,289,564, Cl. 156-425.000.
Olin Corporation: *See*—
Gray, Thomas J., 4,289,650, Cl. 252-425.300.
Kadija, Igor V., 4,289,601, Cl. 204-296.000.
Turley, Richard J., 4,289,712, Cl. 260-967.000.
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,289,946, Cl. 164-503.000.
Ollivier, Francois: *See*—
Neyroud, Jean; and Ollivier, Francois, 4,289,957, Cl. 235-462.000.
Olson, Stephen T., to International Business Machines Corporation. Encoder for monitoring bidirectional motion. 4,289,983, Cl. 310-49.00R.
Olsson, Jerker: *See*—
Nordenstrom, Bjorn; and Olsson, Jerker, 4,289,135, Cl. 128-419.00R.
Olympus Optical Company Limited: *See*—
Takayama, Shuichi; Tsuboshima, Kosaku; Nakajima, Yoshio; Iwasawa, Teruo; and Yamazaki, Masafumi, 4,289,959, Cl. 250-201.000.
Takeuchi, Haruo, 4,288,882, Cl. 15-88.000.
Omco, Inc.: *See*—
Nielsen, Anker J., Jr., 4,289,000, Cl. 70-34.000.
O'Meara, James R., Jr. Device for treating fluids with magnetic lines of force. 4,289,621, Cl. 210-222.000.
Omori, Norio: *See*—
Kinugawa, Masumi; Omori, Norio; and Sueishi, Motoharu, 4,289,100, Cl. 123-339.000.
Omura, Yoshiaki: *See*—
Okabe, Susumu; Omura, Yoshiaki; Ninagawa, Yoichi; and Fujita, Yoshiji, 4,289,786, Cl. 424-312.000.
Onizawa, Masao, to Sanyo Trading Co., Ltd. Curable rubber compositions with amino acids. 4,289,861, Cl. 525-346.000.
Onoda Cement Co., Ltd.: *See*—
Itoh, Tsutomu, 4,289,278, Cl. 239-706.000.
Onoda, Michio: *See*—
Katsumata, Masaaki; Onoda, Michio; Takagi, Yasuo; and Yoneda, Kenji, 4,289,102, Cl. 123-425.000.
Onoue, Keiji: *See*—
Yoshida, Yoshiaki; Suzuki, Osamu; Onoue, Keiji; and Seiki, Kazuo, 4,288,975, Cl. 57-263.000.
Onuma, Kiyoshi; and Arai, Hajime, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic coupling with a lock-up clutch. 4,289,220, Cl. 192-3.300.
Ootsu, Fumio. Underwater accumulator for pressurized gas. 4,289,425, Cl. 405-210.000.
O'Rourke, Thomas E., Jr., to United Technologies Corporation. Turbofan engine having core supercharging stage. 4,288,983, Cl. 60-226.00R.
Orso, Francis L., to Corning Glass Works. Sealing glass-ceramic articles. 4,289,538, Cl. 106-286.500.
Orth, Dieter: *See*—
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Schliep, Hans-Jochen; and Schorscher, Ernst, 4,289,768, Cl. 424-247.000.
Schacht, Erich; Kurmeier, Hans-Adolf; Gante, Joachim; Lissner, Reinhard; Melzer, Guido; and Orth, Dieter, 4,289,774, Cl. 424-250.000.
Orth, Hans: *See*—
Romer, Rudolf; Lips, Hendrik R.; Furch, Benjamin; and Orth, Hans, 4,289,073, Cl. 102-476.000.
Ortho Diagnostics, Inc.: *See*—
Baughman, D. Joseph; and Lytwyn, Ann, 4,289,498, Cl. 23-230.00B.
Hoskins, Michael K.; and Christiansen, Gary D., 4,289,648, Cl. 252-408.000.
Ortho Pharmaceutical Corporation: *See*—
Heavner, George; Tjoeng, Foe-Siong; and Goldstein, Gideon, 4,289,759, Cl. 424-177.000.
Ostertag, Karl: *See*—
Vollbrecht, Balf; and Ostertag, Karl, 4,289,718, Cl. 264-50.000.
Ota, Hiroshi; Horigome, Eiji; and Azegami, Hitoshi, to TDK Electronics Co., Ltd. Magnetic recording medium and process. 4,289,828, Cl. 428-425.900.
Otis Engineering Corporation: *See*—
Fredd, John V., 4,289,165, Cl. 137-625.320.
Fredd, John V., 4,289,201, Cl. 166-183.000.
Henderson, William D., 4,289,202, Cl. 166-212.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Tominaga, Michiaki; Tone, Hitoshi; and Nakagawa, Kazuyuki, 4,289,883, Cl. 546-158.000.
Ott, Karl-Heinz: *See*—
Disselbeck, Dieter; Neumann, Gerhard; Ott, Karl-Heinz; Strobel, Gunther; and Zalewski, Edwin, 4,289,627, Cl. 210-702.000.
Overman, Sherman A., to Monterey Shelf, Inc. Shelf support member incorporating integral live hinge. 4,289,289, Cl. 248-235.000.
Overton, John S., to FMC Corporation. Puller tool. 4,288,900, Cl. 29-263.000.
Owens-Corning Fiberglas Corporation: *See*—
Dereser, Ernst, 4,289,536, Cl. 106-99.000.
Rolston, John A., 4,289,427, Cl. 405-260.000.
Owens-Illinois, Inc.: *See*—
Kontz, Robert F., 4,289,046, Cl. 74-711.000.
Oxoid Limited: *See*—
Whitley, Donald C., 4,289,855, Cl. 435-287.000.
Oy Tampella AB: *See*—
Salmi, Pekka, 4,289,209, Cl. 173-107.000.
Paap, Hans J., to Texaco Inc. Microwave-gamma ray water in crude monitor. 4,289,020, Cl. 73-61.10R.
Paccione, Anthony. Hair styling device. 4,289,153, Cl. 132-85.000.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., to Eli Lilly and Company. Antiviral 1-sulfonylbenzimidazoles. 4,289,782, Cl. 424-273.00B.
Paige Company Containers, Inc., The: *See*—
Paige, Richard E., 4,289,268, Cl. 229-41.00B.
Paige, Richard E., to Paige Company Containers, Inc., The. Foldable carton. 4,289,268, Cl. 229-41.00B.
Palloch, Herbert; and Erndt, Hans, to Frankl & Kirchner GmbH & Co. KG. Optoelectronic synchro generator. 4,289,962, Cl. 250-231.0SE.
Palmer, Douglas S.: *See*—
Rock, Gail A.; and Palmer, Douglas S., 4,289,691, Cl. 260-112.00B.
Palmer, Douglas Stephen: *See*—
Rock, Gail A.; and Palmer, Douglas S., 4,289,691, Cl. 260-112.00B.
Papantoniou, Christos: *See*—
Mahieu, Claude; and Papantoniou, Christos, 4,289,752, Cl. 424-47.000.
Pape, Karl, to Volkswagenwerk AG. Component subjected to thermal stresses and having parts for intended breakage. 4,289,170, Cl. 138-117.000.
Paper, Inc.: *See*—
Booth, Barclay, 4,289,556, Cl. 156-157.000.
Parietti, Pietro. Pressure regulator for combustible gases, in particular for internal-combustion motors. 4,289,106, Cl. 123-527.000.
Parise, Carl, to Parise & Sons, Inc. Hot water vacuum extraction machine with reverse fan cooled vacuum motor. 4,288,885, Cl. 15-321.000.
Parise & Sons, Inc.: *See*—
Parise, Carl, 4,288,885, Cl. 15-321.000.
Parker, John W., to General Signal Corporation. Fail-safe active bandpass filter using a modified twin-T filter. 4,290,027, Cl. 330-293.000.
Parks, Earl L.; and Zaidel, Simon A., to General Electric Company. Process for forming low-reactance interconnections on semiconductors. 4,289,846, Cl. 430-314.000.
Parr, Armin; Kleffner, Harald; and Leder, Harald, to INTERATOM, Internationale Atomreaktorbau GmbH. Nuclear reactor collecting tank with thermal insulation. 4,289,582, Cl. 176-38.000.
Parsen, Frank E.; and Graham, Teresita O., to Duracell International Inc. Method of forming in situ gelled anode. 4,288,913, Cl. 29-623.500.
Particle Data, Inc.: *See*—
Berg, Robert H.; and Karuhn, Richard F., 4,290,011, Cl. 324-71.0CP.
Pasarela, Nunzio R.; and Jang, Choong-Gook, to American Cyanamid Co. Solid compositions of a pyrazolium salt, urea and a liquid surfactant. 4,289,525, Cl. 71-92.000.
Paschke, Edward E.: *See*—
Donohue, John A.; and Paschke, Edward E., 4,289,870, Cl. 528-193.000.
Paskert, Joseph H., to Eaton Corporation. Sheet metal nail. 4,289,058, Cl. 411-451.000.
Pate, Johnny L. Maternity pillow. 4,288,879, Cl. 5-431.000.
Patil, Arvind S., to BASF Wyandotte Corporation. Pigments stable at high temperatures. 4,289,745, Cl. 423-594.000.
Paul Wurth, S.A.: *See*—
Legille, Edouard; and Kremer, Victor, 4,290,067, Cl. 343-12.00R.
Paulson, Arnold E.: *See*—
Jabsen, Felix S.; Schluderberg, Donald C.; and Paulson, Arnold E., 4,289,196, Cl. 165-83.000.
PB Gelatines: *See*—
Hanak, Gyula, 4,289,067, Cl. 100-117.000.
Pearce, Roscoe L.; and Martin, Charles W., to Dow Chemical Company, The. The process for removing H_2S from sour gases with generation of a Claus feed gas. 4,289,738, Cl. 423-228.000.
Pearce, Warren, Jr.; Schramme, Stephan H.; Lightner, John L.; and McGee, Joseph A., to General Motors Corporation. Injectable grommet assembly. 4,289,924, Cl. 174-152.00G.
Pearson, Joe T.: *See*—
Killmeyer, Charles W., deceased; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,289,465, Cl. 425-111.000.
Pedain, Josef: *See*—
Noll, Klaus; Speicher, Wolfgang; Pedain, Josef; and Schmid, Rosemarie, 4,289,827, Cl. 428-423.400.
Pederson, Lester A.: *See*—
Economy, James; Lyerla, James R.; and Pederson, Lester A., 4,289,573, Cl. 156-643.000.
Peel, John L.; and Waites, William M., to National Research Development Corp. Improvements in methods of sterilization. 4,289,728, Cl. 422-24.000.
Peerless Pump Division, Indian Head, Inc.: *See*—
Kuc, Henry, 4,289,317, Cl. 277-1.000.
Penley, Percy A., to Celanese Corporation. High-speed transplanter. 4,289,080, Cl. 111-3.000.

Penner, Gary W. Work piece holder for woodworking machine. 4,289,305, Cl. 269-43.000.
Pennwalt Corporation: *See*—
McKellin, Wilbur H., 4,289,914, Cl. 568-567.000.
Perfection Manufacturing Company, The: *See*—
Hoffmann, Ralph L., 4,289,309, Cl. 272-73.000.
Perrault, Guy; Lavertu, Roger; and Drolet, Jean-Francois, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. High-energy explosive or propellant composition. 4,289,551, Cl. 149-19.400.
Persson, John A.: *See*—
Davis, Howard F., Jr.; and Persson, John A., 4,289,537, Cl. 106-100.000.
Pesch, Jurgen, to G. Siempelkamp GmbH & Co. Apparatus for the pressing of mats of pressable material, especially for the production of particleboard. 4,289,467, Cl. 425-141.000.
Pestka, Sidney; and Rubinstein, Menachem, to Hoffmann-La Roche Inc. Protein purification process and product. 4,289,690, Cl. 260-112.00R.
Pestka, Sidney: *See*—
Friesen, Heinz-Jurgen; and Pestka, Sidney, 4,289,689, Cl. 260-112.00R.
Peter, Donald: *See*—
Hooper, David C.; Johnson, George A.; and Peter, Donald, 4,289,641, Cl. 252-96.000.
Peters, Douglas J., to Ford Motor Company. Engine carburetor throttle blade positioning control. 4,289,107, Cl. 123-571.000.
Peters, Edward N., to Union Carbide Corporation. Curable resin compositions comprising hydroxyl-terminated unsaturated polyester oligomer, a polyisocyanate, an ethylenically unsaturated monomer and a catalyst. 4,289,682, Cl. 260-37.00N.
Petersen, Jorgen S., to Rockwool International A/S. Method for the insulation of roofs. 4,288,964, Cl. 52-747.000.
Petropoulos, Constantine C.: *See*—
Tan, Zoilo C. H.; Petropoulos, Constantine C.; and Rauner, Frederick J., 4,289,842, Cl. 430-270.000.
Pfaff Industriemaschinen GmbH: *See*—
Bolldorf, Kurt; and Bruckner, Ernst, 4,289,086, Cl. 112-221.000.
Pfizer Inc.: *See*—
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,289,704, Cl. 260-345.80R.
Campbell, Simon F.; Danilewicz, John C.; Evans, Anthony G.; and Ham, Allan L., 4,289,772, Cl. 424-250.000.
Gruetsmacher, Gordon D.; and Stephens, Charles R., 4,289,702, Cl. 260-343.700.
Lombardino, Joseph G., 4,289,879, Cl. 544-49.000.
Phillips Petroleum Company: *See*—
Clear, Elmer E., 4,289,632, Cl. 252-8.5LC.
Hofferber, James A., 4,289,588, Cl. 203-2.000.
Johnson, Paul H., 4,289,742, Cl. 423-450.000.
Makovec, Donald J., 4,290,110, Cl. 364-500.000.
Myers, John W., 4,289,919, Cl. 585-664.000.
Swanson, Billy L., 4,289,203, Cl. 166-274.000.
Young, Richard K., 4,289,198, Cl. 165-159.000.
Pickens, George O., to United States of America, Navy. Towed array condition appraisal system. 4,290,123, Cl. 367-13.000.
Pieper, Paul; and Cordier, Walter, to Rolf Peddinghaus. Circular saw with means for opening up the cut slit. 4,289,054, Cl. 83-113.000.
Pierre Fabre S.A.: *See*—
Cousse, Henri; and Mouzin, Gilbert, 4,289,770, Cl. 424-248.540.
Pierson, Karl B., to Betts Machine Company. Receptacle apparatus for housing components of a lighting system. 4,290,098, Cl. 362-267.000.
Pierson, Leslie E. Vent valve for a mobile tank. 4,289,163, Cl. 137-587.000.
Pietzka, Gerhard: *See*—
Kolling, Georg; Pietzka, Gerhard; Romey, Ingo; and Tillmanns, Harald, 4,289,604, Cl. 208-106.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Okutsu, Hiroyasu, 4,288,936, Cl. 40-426.000.
Pilsak, Manfred: *See*—
Block, Werner; Pilsak, Manfred; Dusedau, Klaus; and Greiler, Wolfgang, 4,290,097, Cl. 362-264.000.
Pilwat, Gunter: *See*—
Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann J., 4,289,756, Cl. 424-101.000.
Pinnow, Douglas A.: *See*—
Garvin, Hugh L.; and Pinnow, Douglas A., 4,289,381, Cl. 350-320.000.
Pioneer Electronic Corporation: *See*—
Kotaka, Fumitaka, 4,290,132, Cl. 369-45.000.
Takaoka, Saburo; and Higashi, Ryozi, 4,289,928, Cl. 179-1.00D.
Piotrowski, Alfred B.: *See*—
Davis, Robert H.; and Piotrowski, Alfred B., 4,289,636, Cl. 252-49.300.
Piotti, Peter B., to Gould Inc. Method and apparatus for controlling battery recharging. 4,290,002, Cl. 320-20.000.
Piper, Bert W., to Piper, Bert William. Portable key seat cutter for shafts. 4,289,434, Cl. 409-177.000.
Piper, Bert William: *See*—
Piper, Bert W., 4,289,434, Cl. 409-177.000.
Pitney Bowes, Inc.: *See*—
Stelben, John J., 4,289,395, Cl. 355-3.0BE.
Pitroda, Satyan G.; and Mehta, Madhukumar A., to Wescom Switching Inc. Integrated automatic call distribution facility and PBX system. 4,289,934, Cl. 179-27.00D.
Pitt, Paul E.; Glaser, Edward L.; and Galie, Louis M., to System Development Corporation. Data processing method and means for determining degree of match between two data arrays. 4,290,115, Cl. 364-900.000.
Plaskolite Inc.: *See*—
Casamayor, Jorge, 4,289,818, Cl. 428-43.000.
Platts, Michael J.: *See*—
Comyns-Carr, Cecil A.; and Platts, Michael J., 4,289,455, Cl. 417-332.000.
Plempel, Manfred: *See*—
Sasse, Klaus; Haller, Ingo; Plempel, Manfred; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,289,771, Cl. 424-249.000.
Plessey Company Limited, The: *See*—
Arnold, John S., 4,289,939, Cl. 179-170.00D.
Plessey Incorporated: *See*—
Devlin, Daniel J., 4,289,922, Cl. 174-52.0FP.
Pneumatiques Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See*—
Le Moullac, Roger, 4,289,463, Cl. 425-47.000.
Pogorzhelsky, Viktor I.: *See*—
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.
Poignet, Alain: *See*—
Marti, Bernard; Poignet, Alain; Savary, Jean-Yves; and Brusq, Roger, 4,290,062, Cl. 340-721.000.
Polyakov, Vasily V.: *See*—
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.
Polychrome Corporation: *See*—
Rowe, William; and Golda, Eugene, 4,289,838, Cl. 430-163.000.
Pope, Jessie M. Twin curling iron. 4,289,151, Cl. 132-37.00R.
Popov, Jury S.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M. Electrical machine with cryogenic cooling. 4,289,985, Cl. 310-61.000.
Popp, Franz: *See*—
Herb, Armin; Popp, Franz; and Ruoff, Hanspeter, 4,289,257, Cl. 222-146.0HE.
Portalier, Claude L. L.: *See*—
Lecourt, Guy B. E.; and Portalier, Claude L. L., 4,289,168, Cl. 138-109.000.
Porter, Carl W. Combination sea valve and deballast pump. 4,289,457, Cl. 417-424.000.
Porter, Thomas M., to H. K. Porter, Inc. Chain link tool. 4,289,015, Cl. 72-384.000.
Ports, Kenneth A., to Harris Corporation. Method for qualifying biased integrated circuits on a wafer level. 4,288,911, Cl. 29-574.000.
Potoczky, Joseph B. Apparatus and method for injection molding of elongated hollow plastic container walls. 4,289,726, Cl. 264-318.000.
Potter, David: *See*—
Stewart, Robert E.; Flahive, Barry J.; and Potter, David, 4,290,133, Cl. 370-85.000.
Potters, Cornelis J. T.: *See*—
Franken, Adrianus J. J.; Khoe, Giok D.; Kuyt, Gerard; Van Leest, Johannes H. F. M.; Nicia, Antonius J. A.; Potters, Cornelis J. T.; and Smulders, Hendricus F. G., 4,289,374, Cl. 350-96.200.
Powell, John C.: *See*—
Stoker, James E.; and Powell, John C., 4,289,082, Cl. 112-79.00R.
Powers, Vernon B.; and Crawford, Harry I., to E-Systems, Inc. CMOS Compatible bipolar drive circuit with protective clamp. 4,289,977, Cl. 307-270.000.
PPG Industries, Inc.: *See*—
Briody, Robert G.; and Cummings, Frances M., 4,289,593, Cl. 204-158.00R.
Christenson, Roger M.; Maska, Rudolf; Dowbenko, Rostyslawa; and Hockswender, Thomas R., 4,289,674, Cl. 260-29.6NR.
Dahlberg, J. Robert, 4,289,261, Cl. 225-2.000.
Killmeyer, Charles W., deceased; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,289,465, Cl. 425-111.000.
Prause, Reinhard; and Schlengermann, Udo, to Krautkramer-Branson, Inc. Ultrasonic test apparatus for tubes and rods. 4,289,033, Cl. 73-622.000.
Premier Industrial Corporation: *See*—
Allenbaugh, George G., 4,289,277, Cl. 239-452.000.
Press, Irving D.; and Nickerson, Harvey R., to Resistoflex Corporation. Mechanically attached end fitting with insert for metal tubing. 4,289,340, Cl. 285-382.400.
Price, Ernest J., to E. J. Price (Developments) Limited. Foot pumps. 4,289,458, Cl. 417-464.000.
Price, George M.: *See*—
Moore, Lewis F.; and Price, George M., 4,289,477, Cl. 431-171.000.
Pridham, Roger G.; and Mucci, Ronald A., to Raytheon Company. Beamformer with reduced sampling rate. 4,290,127, Cl. 367-123.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Belfort, Gerard L. A., 4,289,694, Cl. 260-208.000.
Vuillemenot, Jacques; and Grimaud, Edouard, 4,289,915, Cl. 568-609.000.
Proga, Norbert J., to Niagara Machine & Tool Works. Hydraulic position control for mechanical power press slides. 4,289,066, Cl. 100-53.000.

Prueter, E. D.: *See—*
West, Walter H.; and Prueter, E. D., 4,288,896, Cl. 29-157.10R.

Prueter, William P.: *See—*
Carter, Hudson R.; Kidwell, John H.; and Prueter, William P., 4,289,514, Cl. 55-398.000.

Ptaszek, George W.; and Hudson, Robert H. Simulated firing and sighting system. 4,288,943, Cl. 46-227.000.

Puckette, Charles M., to General Electric Company. Digitally programmable phase shifter. 4,290,022, Cl. 328-55.000.

Pudvan, Donna I.: *See—*
Allen, Anna M.; and Pudvan, Donna I., 4,289,308, Cl. 272-70.000.

Pullman Incorporated: *See—*
Keller, Norman L., 4,289,229, Cl. 198-633.000.

Puthawala, Anwer, to Kraftwerk Union Aktiengesellschaft. Method for binding liquid-containing radioactive wastes and kneading machine therefor. 4,289,407, Cl. 366-75.000.

Quantel S.A.: *See—*
Michelet, Guy, 4,289,379, Cl. 350-419.000.

Quayle, Lawrence L., to Maytag Company, The. Self-cleaning float mechanism. 4,289,154, Cl. 134-56.00D.

Quest Automation Limited: *See—*
Lambden, Martin R., 4,289,925, Cl. 178-18.000.

Quietlite International, Ltd.: *See—*
Harper, Clarence E.; and Elliott, William J., 4,289,993, Cl. 315-311.000.

Quinn, Paul A., Jr.: *See—*
Cornelius, Rorger W.; Hill, James D.; and Quinn, Paul A., Jr., 4,289,411, Cl. 400-126.000.

Raaness, Ola S.; and Bakken, Jon A., to SINTEF (Selskapet for Industriell og Teknisk Forskning ved NTH). Plasma burners. 4,289,949, Cl. 219-121.0PR.

Rabeneck, Kenneth H.; Kantlehner, Jerry R.; and Gallaher, David E. Manufacture of sealed-end tubular thermoplastic net bagging. 4,289,569, Cl. 156-580.200.

Rader, Dennis, to Schlumberger Technology Corp. Percussion method and apparatus for the investigation of a casing cement in a borehole. 4,289,023, Cl. 73-151.000.

Radigan, Steven J.; and Berry, Robert L., to Fairchild Camera & Instrument Corp. Process for patterning metal connections on a semiconductor structure by using an aluminum oxide etch resistant layer. 4,289,574, Cl. 156-643.000.

Radovanovich, George D.: *See—*
Carpenter, David A.; Kossoff, George; and Radovanovich, George D., 4,289,140, Cl. 128-660.000.

Radunz, Hans-Eckart: *See—*
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Schliep, Hans-Jochen; and Schorscher, Ernst, 4,289,768, Cl. 424-247.000.

Rahdener Maschinenfabrik August Kolbus GmbH & Co. KG: *See—*
Hedrich, Winfried, 4,289,493, Cl. 493-389.000.

Rait, Joseph M. Safety razor with means to slidably mount cartridge. 4,288,919, Cl. 30-47.000.

Ralston, Richard W.: *See—*
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., 4,290,118, Cl. 365-183.000.

Ramunas, Valdas S., to Acme-Cleveland Corporation. Object centering and moving mechanism. 4,289,051, Cl. 82-45.000.

Ransom, Charles R. Safety charge measuring device for cartridge loading machines. 4,289,258, Cl. 222-308.000.

Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., to United States of America, Health & Human Services. 4A-Aryl-decahydroisoquinolines. 4,289,882, Cl. 546-141.000.

Rapp, Eugen: *See—*
Grullmeier, Artur, 4,288,987, Cl. 60-560.000.

Rassbach, Felix, to Hoechst Aktiengesellschaft. Tubular packaging sheath and process for its manufacture. 4,289,171, Cl. 138-145.000.

Rathmell, William G.: *See—*
Worthington, Paul A.; de Fraine, Paul; Rathmell, William G.; and Gatehouse, Diana M., 4,289,526, Cl. 71-92.000.

Rauchholz, Alvin W.: *See—*
Sawyer, David H.; Henige, Joseph A.; and Rauchholz, Alvin W., 4,289,572, Cl. 156-617.0SP.

Rauner, Frederick J.: *See—*
Tan, Zoilo C. H.; Petropoulos, Constantine C.; and Rauner, Frederick J., 4,289,842, Cl. 430-270.000.

Rawlins, James J., to United States of America, Air Force. Uniform load piston ring. 4,289,264, Cl. 277-27.000.

Raytheon Company: *See—*
Feist, Wolfgang M., 4,289,550, Cl. 148-175.000.
Pridham, Roger G.; and Mucci, Ronald A., 4,290,127, Cl. 367-123.000.

RCA Corporation: *See—*
Clay, Burton R., 4,289,372, Cl. 350-3.830.
Maddox, William J., 4,289,406, Cl. 356-429.000.

Rebish, Edward J., to Lamson & Sessions Co., The. Bolt holding machine wrench. 4,289,049, Cl. 81-56.000.

Recker, Florian B. Torque transmitting coupling. 4,289,414, Cl. 403-12.000.

Reeber, Morton D.: *See—*
Carpenter, Charles; Fugardi, Joseph F.; Gregor, Lawrence V.; Grosewald, Peter S.; and Reeber, Morton D., 4,290,079, Cl. 357-71.000.

Reed, Roger R. Conferencing communications system. 4,289,932, Cl. 179-18.0BC.

Reeder, Willes W.: *See—*
Csurgay, Gregory; and Reeder, Willes W., 4,289,219, Cl. 192-2.000.

Reese, Stanton L.: *See—*
Worthington, Ralph E.; Luke, Donald A.; and Reese, Stanton L., 4,289,609, Cl. 209-11.000.

Reese, Thurston F. Apparatus for reheating, storing and conveying cast bars. 4,289,944, Cl. 219-10.410.

Regie National des Usines Renault: *See—*
Bellot, Dominique; and Cohenca, Alain, 4,289,195, Cl. 165-12.000.

Regie Nationale des Usines Renault: *See—*
Brisabois, Roger, 4,289,045, Cl. 74-701.000.

Reicherts, James E.; and Veschuroff, William C., to United States Gypsum Company. Method for making a mobile home ceiling construction. 4,289,554, Cl. 156-92.000.

Reiff, Helmut: *See—*
Friederich, Klaus; Heinze, Gerhard; Reiff, Helmut; Michael, Dietrich; Schon, Manfred; Markusch, Peter; Haberland, Ulrich; Dieterich, Dieter; and Merten, Josef, 4,289,672, Cl. 260-29.2TN.

Reim, Werner; Gernlein, Hermann; and Zimmermann, Helmuth, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Conveying device for a packing machine or the like. 4,289,228, Cl. 198-339.000.

Reinehr, Dieter, to Ciba-Geigy Corporation. 2-Aza-1,3-dienes. 4,289,905, Cl. 564-248.000.

Remick, Robert J.: *See—*
Lee, Tien S.; Sammells, Anthony F.; and Remick, Robert J., 4,289,835, Cl. 429-50.000.

Remy, Ernst; and Unsold, Eberhard. Apparatus for adjusting the focal point of an operating laser beam focused by an objective. 4,289,378, Cl. 350-174.000.

Renishaw Electrical Limited: *See—*
McMurtry, David R., 4,288,925, Cl. 33-174.00L.

Rennison, Stuart C.: *See—*
Boutle, David L.; Rennison, Stuart C.; and Lambert, Stuart G., 4,289,843, Cl. 430-271.000.

Repp, John R.; and Smith, Donald H., to Ford Motor Company. Seat belt system. 4,289,328, Cl. 280-803.000.

Resistoflex Corporation: *See—*
Press, Irving D.; and Nickerson, Harvey R., 4,289,340, Cl. 285-382.400.

Resovszki, Gabor: *See—*
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth, Zoltan, 4,289,894, Cl. 560-82.000.

Reuter, Wolfgang: *See—*
Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, 4,289,775, Cl. 424-251.000.

Rheinmetall GmbH: *See—*
Romer, Rudolf; Lips, Hendrik R.; Furch, Benjamin; and Orth, Hans, 4,289,073, Cl. 102-476.000.

Rho-Chem Corporation: *See—*
Roehl, Ernest O., 4,289,542, Cl. 134-11.000.

Rhodes, Glenn D. Method and conveyor for snow removal. 4,288,931, Cl. 37-10.000.

Rhodes, Melvin H., to Rockwell International Corporation. Magnetic field strength measuring apparatus with triangular waveform drive means. 4,290,018, Cl. 324-255.000.

Rhone-Poulenc Industries: *See—*
Joubert, Daniel, 4,289,643, Cl. 252-103.000.

Rhone-Poulenc Systemes: *See—*
Michel, Claude, 4,289,394, Cl. 354-299.000.

Rhynes, Oden H. Adjustable fish scorer. 4,288,921, Cl. 30-304.000.

Rich, Guy A., to Albee Laboratories, Inc. Symmetrical quaternary ammonium compounds and their use in heavy metals recovery. 4,289,530, Cl. 75-101.0BE.

Richardson, Edwin A.; Scheuerman, Ronald F.; and Berkshire, David C., to Shell Oil Company. Chemical process for backsurging fluid through well casing perforations. 4,289,633, Cl. 252-8.55B.

Richardson-Merrell Inc.: *See—*
Jones, Winton D.; and Miller, Francis P., 4,289,767, Cl. 424-246.000.

Richardson-Vicks Inc.: *See—*
Dhabhar, Dadi J.; and Shah, Nutan B., 4,289,754, Cl. 424-52.000.
Dhabhar, Dadi J., 4,289,755, Cl. 424-52.000.

Richter, Rudolf: *See—*
Disselbeck, Dieter; and Richter, Rudolf, 4,289,628, Cl. 210-703.000.

Ricoh Co., Ltd.: *See—*
Jinnai, Koichiro; and Iwasaki, Kyuhachiro, 4,290,073, Cl. 346-75.000.

Riedel, Ronald J., to Ryco Mfg. Co. Enclosure for meters. 4,289,361, Cl. 312-100.000.

Rieman, Robert D. Surgical instrument and method of using the same. 4,289,132, Cl. 128-303.140.

Rienzo, Donald D., Sr. Percutaneous pain alleviator methods. 4,289,136, Cl. 128-421.000.

Riley, Harry J., to S. W. Hart & Co. Pty. Ltd. Socket connection for an enamelled vessel. 4,289,334, Cl. 285-55.000.

Riley, Jack G.: *See—*
Warsinske, Arthur E., 4,289,270, Cl. 233-27.000.

Rilling, Ulrich: *See—*
Schotten, Alfons; Spolgen, Herman J.; and Rilling, Ulrich, 4,289,618, Cl. 210-142.000.

Ritz, Jurgen; Hotze, Hermann; and Mummenthey, Hans-Dieter, to Hoechst Aktiengesellschaft. Process for the preparation of copolymers. 4,289,866, Cl. 526-320.000.

Rivin, Evgeny I. Pneumatic wheels for vehicles. 4,289,187, Cl. 152-418.000.

Robert Bosch GmbH: *See—*
Block, Werner; Pilsak, Manfred; Dusedau, Klaus; and Greiler, Wolfgang, 4,290,097, Cl. 362-264.000.
Foerster, Hubert, 4,290,081, Cl. 358-4.000.
Frister, Manfred, 4,289,449, Cl. 416-185.000.
Knorreck, Peter, 4,289,101, Cl. 123-364.000.
Maly, Hans-Peter, 4,289,976, Cl. 307-247.00R.
Norberg, Helmut; and Kinzel, Richard, 4,289,098, Cl. 123-299.000.

Robert, Ramon C. Device for filtering and for humidifying the admission air of an internal combustion engine. 4,289,508, Cl. 55-234.000.

Roberts, Marvin. Wheel improvement for roller skates. 4,289,323, Cl. 280-11.210.

Roberts, Thomas G., to United States of America, Army. Radiation energy detector and analyzer. 4,289,966, Cl. 250-378.000.

Robertshaw Controls Company: *See—*
Everett, Charles J., 4,289,963, Cl. 250-231.00P.

Robichaud, Roger E. Optical time domain reflectometer. 4,289,398, Cl. 356-73.100.

Robinson, David M., to Goldblatt Tool Company. Detachable step. 4,289,215, Cl. 182-92.000.

Robinson, Jeffery H., to Beecham Group Limited. Interferon production. 4,289,850, Cl. 435-68.000.

Rock, Gail A.; and Palmer, Douglas S., to Canadian Red Cross Society, The; Rock, Gail Ann; and Palmer, Douglas Stephen. Method of obtaining intermediate purity factor VIII. 4,289,691, Cl. 260-112.00B.

Rock, Gail Ann: *See—*
Rock, Gail A.; and Palmer, Douglas S., 4,289,691, Cl. 260-112.00B.

Rocket Research Corporation: *See—*
Tacke, Kenneth L.; Galbraith, Lyle D.; and Stewart, Hudson, 4,289,089, Cl. 118-306.000.

Rockwell International Corporation: *See—*
Alers, George A.; Thompson, Robert B.; and Vasile, Carmine F., 4,289,030, Cl. 73-588.000.
Fortunko, Christopher M., 4,290,017, Cl. 324-237.000.
Rhodes, Melvin H., 4,290,018, Cl. 324-255.000.

Rockwool International A/S: *See—*
Petersen, Jorgen S., 4,288,964, Cl. 52-747.000.

Rodeck, Hans J., to Rollei-Werke Franke & Heidecke GmbH & Co. Shutter speed display for viewfinder of a photographic camera. 4,289,391, Cl. 354-219.000.

Rodgers, David: *See—*
Levy, John V.; Rodgers, David; Stewart, Robert E.; and Casabona, Richard J., 4,290,102, Cl. 364-200.000.

Rodgers, James L., to Kurta Corporation. Graphic communication apparatus. 4,289,927, Cl. 178-19.000.

Rody, Jean; and Slongo, Mario, to Ciba-Geigy Corporation. Tetra-alkyl piperidine derivatives as light stabilizers. 4,289,686, Cl. 260-45.8NT.

Roe, Frank L., to Baxter Travenol Laboratories, Inc. Tubing connection for containers generally utilizing dissimilar materials. 4,289,337, Cl. 285-158.000.

Roe International, Inc.: *See—*
Duda, Werner, 4,288,923, Cl. 33-138.000.

Roehl, Ernest O., to Rho-Chem Corporation. Method of vapor degreasing. 4,289,542, Cl. 134-11.000.

Rogers, Bernard T. Liquid pressure control system. 4,289,178, Cl. 144-188.000.

Rogers, Norman H.: *See—*
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,289,779, Cl. 424-263.000.

Rogge, Russell C.: *See—*
Helmbreck, Andrew J., 4,288,878, Cl. 2-427.000.

Rohm and Haas Company: *See—*
Arkens, Charles T., 4,289,823, Cl. 428-245.000.
Calder, G. Vincent; and Mercurio, Andrew, 4,289,678, Cl. 260-33.6UA.

Rolf Peddinghaus: *See—*
Pieper, Paul; and Cordier, Walter, 4,289,054, Cl. 83-113.000.

Rolfe, Norman F., to Waters Associates, Inc. Dissipating electrical charge. 4,289,975, Cl. 307-246.000.

Rollei-Werke Franke & Heidecke GmbH & Co.: *See—*
Rodeck, Hans J., 4,289,391, Cl. 354-219.000.

Rolls-Royce Limited: *See—*
McMurtry, David R., 4,288,925, Cl. 33-174.00L.

Rolston, John A., to Owens-Corning Fiberglas Corporation. Process for installing roof bolts. 4,289,427, Cl. 405-260.000.

Romer, Rudolf; Lips, Hendrik R.; Furch, Benjamin; and Orth, Hans, to Rheinmetall GmbH. Warhead with a plurality of slave missiles. 4,289,073, Cl. 102-476.000.

Romey, Ingo: *See—*
Kolling, Georg; Pietzka, Gerhard; Romey, Ingo; and Tillmanns, Harald, 4,289,604, Cl. 208-106.000.

Romig, Joseph H.: *See—*
Fogelberg, Clement V.; and Romig, Joseph H., 4,289,816, Cl. 428-35.000.

Roncaglione, Walter. Portable sublimation refrigerator-freezer. 4,288,996, Cl. 62-384.000.

Roncarolo, Giuseppe, to Fiat Trattori S.p.A. Device for controlling agricultural implements mounted on an agricultural vehicle. 4,289,208, Cl. 172-7.000.

Ronen, Ram S., to Xerox Corporation. High voltage MOSFET with inter-device isolation structure. 4,290,077, Cl. 357-41.000.

Ronen, Ram S., to Xerox Corporation. High voltage MOSFET without field plate structure. 4,290,078, Cl. 357-41.000.

Rose, Bobby H., to Gold King Mfg. Co. Attachment flange for flexible conduit. 4,289,355, Cl. 299-9.000.

Roseen, Rutger A., to Studsvik Energiteknik AB. Heat storing solar collector device. 4,289,112, Cl. 126-415.000.

Rosenblatt, Stephen L. Automated cooker. 4,289,064, Cl. 99-334.000.

Rosenbusch, Kurt: *See—*
Hudec, Gustav; Keil, Karl-Heinz; Kohler, Volker; and Rosenbusch, Kurt, 4,289,665, Cl. 260-21.000.

Rossetti, Pierre C., to Silec-Semi-Conducteurs. Method for metallizing ceramic substrates and new, thus obtained products. 4,289,829, Cl. 428-469.000.

Rostoucher, Guy, to Kuhn S. A. Haymaking machines for tedding and windrowing. 4,288,972, Cl. 56-370.000.

Rothfuss, Robert G., to Senco Products, Inc. Cut-through backup washer for the scalpel of an intraluminal surgical stapling instrument. 4,289,133, Cl. 128-334.00C.

Rotork Limited: *See—*
Hore, Donald L., 4,289,038, Cl. 74-2.000.

Rovin, Herman. Bobbin loading apparatus for sewing machines. 4,289,085, Cl. 112-181.000.

Rowan, Hugh H.; Mueller, Max B.; and Lazarus, Stanley D., to Allied Chemical Corporation. Method to increase reactor capacity for polycondensation of polyesters. 4,289,871, Cl. 528-309.000.

Rowe, William; and Golda, Eugene, to Polychrome Corporation. Diazo-unsaturated monomer light sensitive compositions. 4,289,838, Cl. 430-163.000.

Rowland, Stanley P., to United States of America, Agriculture. Process for producing durable-press cotton fabrics with improved balances of textile properties. 4,289,673, Cl. 260-29.40R.

Roy, Pradip K.: *See—*
Kleiner, Fredric; Roy, Pradip K.; and Kuchman, Michael J., 4,289,794, Cl. 426-660.000.

Royer, Gerard, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Ink drop generator for ink jet printer. 4,290,074, Cl. 346-75.000.

Rubinstein, Menachem: *See—*
Pestka, Sidney; and Rubinstein, Menachem, 4,289,690, Cl. 260-112.00R.

Ruble, Eulalia B., executrix: *See—*
Ruble, Theodore A., deceased, 4,289,743, Cl. 423-450.000.

Ruble, Theodore A., deceased (by Ruble, Eulalia B., executrix), to Sid Richardson Carbon & Gasoline Co. Double venturi carbon black reactor system. 4,289,743, Cl. 423-450.000.

Rue, Marvin E.: *See—*
Shefbuch, Robert J.; and Rue, Marvin E., 4,289,424, Cl. 405-179.000.

Rueggeberg, Werner: *See—*
Bagley, George E.; McCreary, Willard E.; and Rueggeberg, Werner, 4,289,798, Cl. 427-39.000.

Ruf, Max: *See—*
Ehemann, Horst; and Ruf, Max, 4,289,159, Cl. 137-454.400.

Ruhl, Werner: *See—*
Haker, Rolf; Fuhrer, Heinz-Georg; van Rijckevorsel, Rainer; Ruhl, Werner; and Thiery, Joachim, 4,290,113, Cl. 364-900.000.

Ruoff, Hanspeter: *See—*
Herb, Armin; Popp, Franz; and Ruoff, Hanspeter, 4,289,257, Cl. 222-146.0HE.

Rusch, Heinz, to Willy Rusch GmbH & Co. KG. Laryngeal tube. 4,289,128, Cl. 128-207.150.

Russ Schneider & Associates: *See—*
Schneider, John R.; and Mangione, Joseph F., 4,289,615, Cl. 210-91.000.

Russell, James T.; and Davis, Thomas J., to Exxon Nuclear Company, Inc. Magnetostrictive non-contacting pressure detection system. 4,289,987, Cl. 310-26.000.

Rutgers, Hendrik J., to U.S. Philips Corporation. Detachable plug and track receptacle for electrical connections. 4,289,365, Cl. 339-21.00R.

Rutschke, Roger M. Cigarette package closure. 4,289,234, Cl. 206-259.000.

Ryan, Ben T.: *See—*
Duncan, Jimmie D.; and Ryan, Ben T., 4,289,714, Cl. 261-34.00R.

Ryco Graphic Manufacturing, Inc.: *See—*
Switall, Thomas G., 4,289,167, Cl. 137-869.000.

Ryco Mfg. Co.: *See—*
Riedel, Ronald J., 4,289,361, Cl. 312-100.000.

Ryobi Ltd.: *See—*
Morimoto, Yoshinori, 4,289,283, Cl. 242-84.20R.

S. C. Johnson & Son, Inc.: *See—*
Hernandez, Pablo M., 4,289,671, Cl. 260-28.5AV.

S. W. Hart & Co. Pty. Ltd.: *See—*
Riley, Harry J., 4,289,334, Cl. 285-55.000.

Saba, Manlio; and Szocs, Roberto, to Societa Italiana Telecomunicazioni Siemens S.p.A. Circuit arrangement for compensating temperature-dependent frequency variations of a crystal-controlled oscillator. 4,290,145, Cl. 455-113.000.

Sabad, Joseph J.: *See—*
Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; Martone, James F.; and Sabad, Joseph J., 4,289,666, Cl. 260-23.00H.
Creekmore, Fred M.; Kennair, Dorothy J.; Livingston, Benjamin F.; and Sabad, Joseph J., 4,289,670, Cl. 260-28.5AV.

Sabatka, Winston E., to Finishing Equipment, Inc. Solvent recovery method. 4,289,586, Cl. 203-1.000.

Sable, Chester A., to Anthony Pools, Div. of Anthony Indus. Apparatus for cleaning a swimming pool. 4,289,155, Cl. 134-167.00R.

Sado, Ryoichi; and Morikawa, Yoshitusgu, to Shin-Etsu Polymer Company, Ltd. Keyboard switch covering pads. 4,289,940, Cl. 200-5.00A.

Sado, Ryoichi, to Shin-Etsu Polymer Co., Ltd. Push-button switches. 4,289,943, Cl. 200-159.00B.

Sahara, Masayoshi: *See*—
Kobori, Toshio; and Sahara, Masayoshi, 4,289,389, Cl. 354-31.000.

Saint-Gobain Industries: *See*—
Battigelli, Jean A.; and Bouquet, Francois, 4,289,518, Cl. 65-15.000.

Saito, Hirokazu; Suzuki, Keiichi; Shimizu, Masayuki; and Miyahara, Junji, to Fuji Photo Film Co., Ltd. Apparatus for making silver halide grains. 4,289,733, Cl. 422-227.000.

Saito, Koji: *See*—
Enjoji, Susumu; and Saito, Koji, 4,289,139, Cl. 128-660.000.

Saito, Nobuo: *See*—
Sugie, Mamoru; Yamaguchi, Noboru; Mayama, Koichi; Kita, Yuzo; Yoshizawa, Shigeru; Saito, Nobuo; and Asano, Atsushi, 4,290,117, Cl. 365-15.000.

Sakai, Yoshihiro: *See*—
Abe, Masaru; Sakai, Yoshihiro; Enoki, Yasutaka; and Sawada, Noriyasu, 4,289,183, Cl. 152-209.00B.

Sakamoto, Hitoshi; and Takano, Kazuhiro, to Sony Corporation. Tape control apparatus. 4,289,284, Cl. 242-186.000.

Sakamoto, Junji; and Kishi, Hiroyasu, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Pulsive component detecting apparatus. 4,289,981, Cl. 307-350.000.

Sakamoto, Tetsuo: *See*—
Murakawa, Takeyoshi; Sakamoto, Tetsuo; and Oka, Yutaka, 4,289,523, Cl. 65-172.000.

Salmi, Pekka, to Oy Tampella AB. Impact device with fluid tool rotation motor. 4,289,209, Cl. 173-107.000.

Samek, Norbert E., to Bell & Howell Company. Electrode structures and interconnecting system. 4,289,384, Cl. 350-392.000.

Sammells, Anthony F.: *See*—
Lee, Tien S.; Sammells, Anthony F.; and Remick, Robert J., 4,289,835, Cl. 429-50.000.

Sampey, Larry A., Sr.: *See*—
Sampey, William P.; and Sampey, Larry A., Sr., 4,289,421, Cl. 404-106.000.

Sampey, William P.; and Sampey, Larry A., Sr. Concrete road paving assembly. 4,289,421, Cl. 404-106.000.

Sampson, Milo J. Material handling apparatus. 4,289,619, Cl. 210-159.000.

Sampson, Robert W.; and Franke, Francis H., to UOP Inc. High temperature injection and vaporization system for gas chromatography. 4,289,029, Cl. 73-863.110.

Sandoz Ltd.: *See*—
Henzi, Beat, 4,289,693, Cl. 260-146.00R.
Lister, Gordon H., 4,289,496, Cl. 8-477.000.
Spiegel, Rene, 4,289,780, Cl. 424-267.000.
Traber, Rene P.; Kuhn, Max; Hofmann, Hans; and Harri, Eugen, 4,289,851, Cl. 435-71.000.

Sandvik Aktiebolag: *See*—
Lumen, Karl L. G., 4,289,211, Cl. 175-410.000.

Sangamo Weston, Inc.: *See*—
Greenfield, George, 4,290,023, Cl. 330-9.000.

Sangu, Osamu: *See*—
Taniguchi, Koichi; Katayama, Minoru; Sangu, Osamu; and Hori, Shinichi, 4,290,109, Cl. 364-481.000.

Sanpei, Konomu; and Fujii, Tadaaki, to Hitachi, Ltd. Standing wave ratio detecting apparatus. 4,290,009, Cl. 324-57.00R.

Sansregret, Joseph L., to Exxon Research and Engineering Co. Electrochemical oxidation of amorphous silicon. 4,289,602, Cl. 204-32.00S.

Sanyo Electric Co., Ltd.: *See*—
Sakamoto, Junji; and Kishi, Hiroyasu, 4,289,981, Cl. 307-350.000.

Sanyo Trading Co., Ltd.: *See*—
Onizawa, Masao, 4,289,861, Cl. 525-346.000.

Sargeant, Roger E., to Innovate, Inc. Pneumatic dental scaler. 4,289,486, Cl. 433-118.000.

Sarvas, Walter P., to General Electric Company. Method for making high resolution phosphorescent output screens. 4,289,799, Cl. 427-65.000.

Sasaki, Teruo: *See*—
Tominaga, Ichiro; and Sasaki, Teruo, 4,289,031, Cl. 73-597.000.
Tominaga, Ichiro; and Sasaki, Teruo, 4,289,032, Cl. 73-599.000.

Sasse, Klaus; Haller, Ingo; Plempel, Manfred; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 3-Sulphonyl-benzo-1,2,4-triazine and 3-sulphonyl-benzo-1,2,4-triazine 1-oxide compounds, their production and their medicinal use. 4,289,771, Cl. 424-249.000.

Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, to Nippon Petrochemicals Company, Limited. Pressure-sensitive recording material. 4,289,806, Cl. 427-150.000.

Sato, Atsushi; Shimizu, Isoo; and Gotoh, Masahito, to Nippon Petrochemical Company, Limited. Aralkylation. 4,289,918, Cl. 585-422.000.

Sato, Kazuyoshi: *See*—
Ando, Ryo; Sato, Kazuyoshi; and Honda, Akira, 4,289,462, Cl. 425-8.000.

Sato, Koji: *See*—
Usami, Akira; Uebayashi, Toshiaki; Sato, Koji; and Goda, Tomoko, 4,289,130, Cl. 128-287.000.

Sato, Takeshi; and Kojima, Hiroshi, to Bridgestone Tire Company Limited. Pneumatic tires for large size and high speed motorcycles. 4,289,182, Cl. 152-209.00R.

Sato, Yoshitoshi, to Yamamoto Electric Industrial Co., Ltd. Controller for electric motor. 4,290,042, Cl. 338-113.000.

Satoh, Paul S., to Upjohn Company, The. Horizontal electrophoresis or isoelectric focusing apparatus and method of using same. 4,289,596, Cl. 204-180.00R.

Satou, Takateru: *See*—
Ishida, Toshihiko; and Satou, Takateru, 4,289,285, Cl. 242-199.000.

Savary, Jean-Yves: *See*—
Marti, Bernard; Poignet, Alain; Savary, Jean-Yves; and Brusq, Roger, 4,290,062, Cl. 340-721.000.

Sawada, Noriyasu: *See*—
Abe, Masaru; Sakai, Yoshihiro; Enoki, Yasutaka; and Sawada, Noriyasu, 4,289,183, Cl. 152-209.00B.

Sawamura, Mitsuyoshi, to Amada Company, Limited. Deviation detecting apparatus for a bandsaw blade for horizontal bandsaw machines. 4,289,053, Cl. 83-62.100.

Sawyer, David H.; Henige, Joseph A.; and Rauchholz, Alvin W., to Dow Corning Corporation. Method of closing silicon tubular bodies. 4,289,572, Cl. 156-617.0SP.

Scafaro, Vincent J. Expansion tool. 4,289,050, Cl. 81-311.000.

Scapa-Porritt Limited: *See*—
Miller, Terence, 4,289,173, Cl. 139-383.00A.

Schabowski, Albin J.: *See*—
Kielma, Eryin J.; Schabowski, Albin J.; and Currer, John T., 4,288,909, Cl. 29-568.000.

Schacht, Erich; Kurmeier, Hans-Adolf; Gante, Joachim; Lissner, Reinhard; Melzer, Guido; and Orth, Dieter, to Merck Patent Gesellschaft mit beschrankter Haftung. Lipid lowering and anti-thrombotic 6-arylpyridazin-3-ones and a process for their preparation. 4,289,774, Cl. 424-250.000.

Schaefer, Edward J., to Franklin Electric Co., Inc. Centrifugal mechanism and switch. 4,289,988, Cl. 310-68.00E.

Schaper, Ulf-Armin; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Perfume compositions containing tricyclo[5.2.1.$0^{2,6}$]decane carboxylic acid esters. 4,289,660, Cl. 252-522.00R.

Scheirer, James W.: *See*—
Chuss, David M.; and Scheirer, James W., 4,289,584, Cl. 201-39.000.

Schering, Aktiengesellschaft: *See*—
Albrecht, Rudolf; Schroder, Eberhard; and Bottcher, Irmgard, 4,289,777, Cl. 424-258.000.
Kruger, Hans-Rudolf, 4,289,897, Cl. 560-159.000.
Laurent, Henry; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, 4,289,763, Cl. 424-243.000.

Scherr, Ronald R. Preheater for aircraft engines. 4,289,095, Cl. 123-142.50R.

Schetina, Otto: *See*—
Hintermann, Rudolf; Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, 4,289,357, Cl. 299-81.000.

Scheu, William E., Jr. Electrically heated solder extractor. 4,289,953, Cl. 219-230.000.

Scheuerman, Ronald F.: *See*—
Richardson, Edwin A.; Scheuerman, Ronald F.; and Berkshire, David C., 4,289,633, Cl. 252-8.55B.

Schibline, Patrick J., to Marathon Electric Manufacturing Corp. Brushless exciter rotor mounting. 4,289,989, Cl. 310-261.000.

Schiefer, Erwin, to Hilti Aktiengesellschaft. Expansion dowel. 4,289,062, Cl. 411-34.000.

Schildkraut, Alan L., to Bendix Corporation, The. Full mate indicator for detachable connectors. 4,289,368, Cl. 339-89.00M.

Schinski, William L.; and Freenor, Francis J., III, to Chevron Research. Lactone substituted aniline preparation. 4,289,701, Cl. 260-343.600.

Schlengermann, Udo: *See*—
Prause, Reinhard; and Schlengermann, Udo, 4,289,033, Cl. 73-622.000.

Schliep, Hans-Jochen: *See*—
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Schliep, Hans-Jochen; and Schorscher, Ernst, 4,289,768, Cl. 424-247.000.

Schlobohm, Joachim: *See*—
Warncke, Ernst; Schlobohm, Joachim; and Behnke, Jurgen, 4,289,238, Cl. 206-527.000.

Schluderberg, Donald C.: *See*—
Jabsen, Felix S.; Schluderberg, Donald C.; and Paulson, Arnold E., 4,289,196, Cl. 165-83.000.

Schlumberger Technology Corp.: *See*—
Rader, Dennis, 4,289,023, Cl. 73-151.000.

Schmeckenbecher, Arnold F.: *See*—
McIntosh, Charles M.; and Schmeckenbecher, Arnold F., 4,289,719, Cl. 264-61.000.

Schmid, Rosemarie: *See*—
Noll, Klaus; Speicher, Wolfgang; Pedain, Josef; and Schmid, Rosemarie, 4,289,827, Cl. 428-423.400.

Schmidt, Fritz. Plate and method for laying railway level crossings. 4,289,273, Cl. 238-8.000.

Schmidt, Henry, Jr.; Cederholm, Allen E.; and Zievers, James F., to Industrial Filter & Pump Mfg. Co. Filter cake removal method and apparatus. 4,289,630, Cl. 210-785.000.

Schmidt, Reinhard: *See*—
Burkhardt, Rudolf; Meyer, Gunther; Schmidt, Reinhard; and Thewalt, Klaus, 4,289,895, Cl. 560-92.000.

Schmidt, Robert C. H. Aiming post light. 4,290,095, Cl. 362-191.000.

Schmitt, Frederick L.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,289,146, Cl. 131-276.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwal., Jacob, 4,289,705, Cl. 260-345.100.

Schmitz, John S.: *See*—
Steele, Thomas L., 4,289,008, Cl. 72-83.000.

Schnee, Rolf; Kraus, Franz; Kiel, Friedrich; Kliem, Helmut; Krick, Wolfgang; and Landgraf, Herbert, to Heinrich-Hertz-Institut fur Nachrichtentechnik Berlin GmbH. Interactive cable television system. 4,290,142, Cl. 455-3.000.

Schneider, John R.; and Mangione, Joseph F., to Russ Schneider & Associates. Filter media mover for plate type filter. 4,289,615, Cl. 210-91.000.

Schnitz, Louis: *See*—
Frankhouser, Douglas L.; Schnitz, Louis; and Greenstadt, Joseph C., 4,289,244, Cl. 211-117.000.

Schnur, Andrew C.; and Wilhelm, Donald M., to California Pellet Mill Company. Polylobe drive element. 4,288,998, Cl. 64-9.00R.

Schoeffler, William H. Impact drill bit actuator. 4,289,210, Cl. 175-319.000.

Scholes, Addison B., to Ball Corporation. Modular gas cleaner and method. 4,289,504, Cl. 55-11.000.

Scholta, Owen R., to Thorne Industries, Inc. Air compressor and dispenser. 4,289,225, Cl. 194-9.00T.

Schon, Manfred: *See*—
Friederich, Klaus; Heinze, Gerhard; Reiff, Helmut; Michael, Dietrich; Schon, Manfred; Markusch, Peter; Haberland, Ulrich; Dieterich, Dieter; and Merten, Josef, 4,289,672, Cl. 260-29.2TN.

Schorscher, Ernst: *See*—
Gante, Joachim; Radunz, Hans-Eckart; Orth, Dieter; Schliep, Hans-Jochen; and Schorscher, Ernst, 4,289,768, Cl. 424-247.000.

Schotten, Alfons; Spolgen, Herman J.; and Rilling, Ulrich, to Eberhard Hoesch & Sohne GmbH & Co. Motion control for a filter press. 4,289,618, Cl. 210-142.000.

Schotten, Alfons, to Eberhard Hoesch & Sohne GmbH & Co. Plate filter press with filter cloth transport. 4,289,622, Cl. 210-225.000.

Schramme, Stephan H.: *See*—
Pearce, Warren, Jr.; Schramme, Stephan H.; Lightner, John L.; and McGee, Joseph A., 4,289,924, Cl. 174-152.00G.

Schreck, Ronald: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Hall, John B.; Kasper, Robin; Vock, Manfred H.; Schreck, Ronald; Granda, Edward J.; and Vinals, Joaquin F., 4,289,145, Cl. 131-276.000.

Schreurs, Willy P., to GTE Products Corporation. Fluorescent lamp with a low reflectivity protective film of aluminum oxide. 4,289,991, Cl. 313-489.000.

Schrieber, Glenn H., to Texasgulf Inc. Phosphate ore triple float. 4,289,612, Cl. 209-166.000.

Schroder, Eberhard: *See*—
Albrecht, Rudolf; Schroder, Eberhard; and Bottcher, Irmgard, 4,289,777, Cl. 424-258.000.

Schroeck, Calvin W., to Lubrizol Corporation, The. Process for preparing molybdenum-containing compositions useful for improved fuel economy of internal combustion engines. 4,289,635, Cl. 252-32.70E.

Schubert & Salzer: *See*—
Teubner, Ehrhardt, 4,289,402, Cl. 356-313.000.

Schulte-Elte, Karl-Heinrich; Willhalm, Bruno; and Gautschi, Fritz, to Firmenich SA. Cyclic C_6 esters and their use in perfumes. 4,289,659, Cl. 252-522.00R.

Schultes, Herbert: *See*—
Lermann, Peter; Wagner, Karl; Schultes, Herbert; and Fauth, Gunter, 4,289,390, Cl. 354-187.000.

Schulz, Daniel R. Controller for an air conditioning or heating system. 4,288,990, Cl. 62-158.000.

Schwarz, Eckhard C. A., to Biax Fiberfilm Corp. Chemically-impregnated microporous films. 4,289,832, Cl. 428-542.000.

Schwarzschild, Jack, to Timex Corporation. Lighted dot matrix display. 4,289,383, Cl. 350-334.000.

Schymura, Konrad, to Metallgesellschaft Aktiengesellschaft. Apparatus for producing a foamed-glass or foamed-ceramic strip. 4,289,521, Cl. 65-144.000.

Scibelli, John V., to Minnesota Mining and Manufacturing Co. Sterility indicating device. 4,289,088, Cl. 116-218.000.

Scientific Applications Incorporated: *See*—
Carlson, Denny L.; Brissey, David C.; and Vriezelaar, Lee W., 4,288,951, Cl. 52-94.000.

Sciortino, August M. Universal funnel and mounting bracket for coin receptacles of coin operated machines. 4,289,269, Cl. 232-16.000.

SCM Corporation: *See*—
Kane, Bernard J.; and Traynor, Sean G., 4,289,917, Cl. 585-359.000.
Traynor, Sean G.; and Marcelin, George, 4,289,809, Cl. 427-230.000.

Scott, George B. Free standing merchandiser. 4,289,246, Cl. 211-205.000.

Scott Paper Company: *See*—
Gray, Lorin S., III; Mattor, John A.; Millard, Ben; and Ward, Franklin J., 4,289,821, Cl. 428-172.000.

Scott, Robert H.; Thigpen, Hubert H.; and Wood, Frank, Jr., to Celanese Corporation. Catalyst metal separation from saturated aliphatic monocarboxylic acids. 4,289,708, Cl. 260-413.000.

Scripa, Lesleigh V.: *See*—
Lazarz, Christine A.; Cook, Edward H., Jr.; and Scripa, Lesleigh V., 4,289,600, Cl. 204-296.000.

Seach, Barry G.: *See*—
Golczewski, Roman; Seach, Barry G.; and Cohen, Solomon E., 4,289,624, Cl. 210-404.000.

Seaman, Robert L., to Borg-Warner Corporation. Angular output transfer case. 4,289,213, Cl. 180-233.000.

Sedlak, John M.: *See*—
Davidson, Craig R.; and Sedlak, John M., 4,289,591, Cl. 204-129.000.

Seegmiller, Wan: *See*—
Young, Bruce O.; and Seegmiller, Wan, 4,289,419, Cl. 404-6.000.

Seeley, Elwin W.: *See*—
Hansen, Peder M.; Hoffman, John G.; Seeley, Elwin W.; and Andrew, Wesley A., 4,290,020, Cl. 324-334.000.

Seeley, Wayne R., to Emerson Electric Co. Electric heating assemblies with a mounted thermostatic switch. 4,289,955, Cl. 219-532.000.

Seibel, Paula; and Stettler, Wayne J., to Seibel, Paula. Diaphragm case or the like. 4,289,232, Cl. 206-37.000.

Seiki, Kazuo: *See*—
Yoshida, Yoshiaki; Suzuki, Osamu; Onoue, Keiji; and Seiki, Kazuo, 4,288,975, Cl. 57-263.000.

Seireg, Ali A.; and Baz, Amr M. S., to Wisconsin Alumni Research Foundation. Pressure regulator for breathing apparatus. 4,289,126, Cl. 128-204.240.

Sekiguchi, Akira: *See*—
Inagawa, Takashi; Kushida, Naoto; Sekiguchi, Akira; Ikeda, Matujiro; Sugawara, Hidetoshi; and Naito, Kunio, 4,290,037, Cl. 335-202.000.

Seko, Kiyoshi; and Ichikawa, Mamoru, to Fuji Machinery Co. Ltd.; and Japan Packaging Machinery Manu. Assn., part interest to each. Center sealing device for a plastic film in a packaging apparatus. 4,288,967, Cl. 53-550.000.

Seko, Kiyoshi; and Ichikawa, Mamoru, to Fuji Machinery Co., Ltd.; and Japan Packaging Machinery Manu. Assn., part interest to each. End sealing device for a plastic film in a packaging apparatus. 4,288,968, Cl. 53-550.000.

Selas Corporation of America: *See*—
Wall, Fraser M.; Kitzen, Maurice R.; and Kreipe, T. Frederick, 4,289,475, Cl. 431-11.000.

Senco Products, Inc.: *See*—
Rothfuss, Robert G., 4,289,133, Cl. 128-334.00C.

Seplin, Stanley. Cartridge and ribbon for use with a single spool stenotype machine. 4,289,413, Cl. 400-196.000.

Serizawa, Norio: *See*—
Fukasawa, Akira; Masaki, Shinzaburo; and Serizawa, Norio, 4,289,706, Cl. 260-369.000.

Serrano, Juan de J., to General Electric Company. Electrically integrated touch input and output display system. 4,290,061, Cl. 340-712.000.

Sethi, Amar J.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,289,540, Cl. 127-33.000.

Shah, Nutan B.: *See*—
Dhabhar, Dadi J.; and Shah, Nutan B., 4,289,754, Cl. 424-52.000.

Shah, Ricky H., to Zenith Radio Corporation. Method for providing an electrically conductive bridge in cathode ray tubes. 4,289,800, Cl. 427-68.000.

Shapiro, Aron B.: *See*—
Aroshidze, Jury V.; Kadi-Ogly, Ibragim A.; Chernyavsky, Vladimir P.; Shapiro, Aron B.; Fomin, Boris I.; and Yankov, Anatoly F., 4,289,984, Cl. 310-54.000.

Sharkness, James E.: *See*—
Alpaugh, Warren A.; Macur, George J.; and Sharkness, James E., 4,289,594, Cl. 204-158.00R.

Shashaty, Alex, to Fairfield Machine Company. Method and apparatus for simultaneously boring and turning upset pipe end. 4,289,430, Cl. 408-1.00R.

Sheen, Shuh J.: *See*—
Wildman, Samuel G.; and Sheen, Shuh J., 4,289,147, Cl. 131-290.000.

Shefbuch, Robert J.; and Rue, Marvin E., to Rue, Marvin E. Apparatus for laying conduit, cable and the like in or beneath fill material. 4,289,424, Cl. 405-179.000.

Shell Oil Company: *See*—
Barker, Michael D., 4,289,884, Cl. 546-283.000.
Richardson, Edwin A.; Scheuerman, Ronald F.; and Berkshire, David C., 4,289,633, Cl. 252-8.55B.

Shelley, Ralph R., Jr., to Celanese Corporation. Stable aqueous dispersions of mixed resins and process for use as coating compositions. 4,289,811, Cl. 427-239.000.

Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Swash-plate type compressor. 4,289,453, Cl. 417-269.000.

Shier, Stephen F. Percussion kit. 4,289,056, Cl. 84-412.000.

Shimada, Toshikazu; Katayama, Yoshifumi; and Komatsubara, Kiichi F., to Hitachi, Ltd. Light-sensitive film. 4,289,822, Cl. 428-212.000.

Shimadzu Corporation: *See*—
Koga, Kenichiro; Hirose, Yoshiharu; Kanno, Iwao; Uemura, Kazuo; and Miura, Shuichi, 4,289,965, Cl. 250-363.00S.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,289,490, Cl. 474-144.000.

Shimizu, Hidetoshi: *See*—
Shirai, Kenji; Shimizu, Hidetoshi; and Tanoue, Junichi, 4,289,216, Cl. 188-72.200.

Shimizu, Isoo: *See*—
Sato, Atsushi; Shimizu, Isoo; and Matsuzaka, Eiichi, 4,289,806, Cl. 427-150.000.
Sato, Atsushi; Shimizu, Isoo; and Gotoh, Masahito, 4,289,918, Cl. 585-422.000.

Shimizu, Masayuki: *See*—
Saito, Hirokazu; Suzuki, Keiichi; Shimizu, Masayuki; and Miyahara, Junji, 4,289,733, Cl. 422-227.000.

Shin-Etsu Polymer Company, Ltd.: *See—*
Sado, Ryoichi; and Morikawa, Yoshitusgu, 4,289,940, Cl. 200-5.00A.
Sado, Ryoichi, 4,289,943, Cl. 200-159.00B.
Shin, Kju H., to Ethyl Corporation. Chemical process for preparing methylene bis-anilines. 4,289,906, Cl. 564-330.000.
Shinoda, Kazuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Altitude compensating device of an internal combustion engine. 4,289,103, Cl. 123-440.000.
Shionogi & Co., Ltd.: *See—*
Hoshino, Yoshikazu; and Shuto, Masayoshi, 4,290,008, Cl. 324-57.00R.
Shioyama, Giichi, to Nissan Motor Company, Limited. Exhaust gas recirculation rate control device. 4,289,108, Cl. 123-571.000.
Shirai, Kenji; Shimizu, Hidetoshi; and Tanoue, Junichi, to Toyota Jidosha Kogyo Kabushiki. Disc brake. 4,289,216, Cl. 188-72.200.
Shishido, Toetsu: *See—*
Yajima, Seishi; Shishido, Toetsu; Okamura, Kiyohito; Kayano, Hideo; Hayashi, Josaburo; and Kobayashi, Hiroshi, 4,289,720, Cl. 264-63.000.
Shlykov, Gennady N.: *See—*
Tikhonov, Valentin N.; Zhestkov, Vitaly I.; Shlykov, Gennady N.; Diachkov, Vasily M.; Mukhin, Viktor M.; and Zhigalov, Gennady V., 4,288,889, Cl. 19-236.000.
Shohata, Nobuaki: *See—*
Utsumi, Kazuaki; Shohata, Nobuaki; and Ohno, Tomeji, 4,290,041, Cl. 338-21.000.
Shoji, Masashi, to Nippon Electric Co., Ltd. Power amplifier whose bias voltage changes depending on power supply voltage. 4,290,026, Cl. 330-255.000.
Shulgin, Grigory M.: *See—*
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.
Shum, Valentin B.: *See—*
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.
Shuto, Masayoshi: *See—*
Hoshino, Yoshikazu; and Shuto, Masayoshi, 4,290,008, Cl. 324-57.00R.
Shutt, Harry: *See—*
Connolly, David C. A.; and Shutt, Harry, 4,289,930, Cl. 179-2.0TV.
Sid Richardson Carbon & Gasoline Co.: *See—*
Ruble, Theodore A., deceased, 4,289,743, Cl. 423-450.000.
SIDMAR Maritieme Staalnijverheid NV., Siderurgie Maritime S.A.: *See—*
Monteyne, Guido, 4,289,519, Cl. 65-19.000.
Siegler, Frederick. Air broom. 4,288,886, Cl. 15-330.000.
Siegwart, Emil. Fluid flow regulator. 4,289,161, Cl. 137-499.000.
Siemens Aktiengesellschaft: *See—*
Blaess, Gerhard; and Bauernfeind, Karl, 4,290,010, Cl. 324-57.0SS.
Brunner, Heinrich; Drebinger, Peter; Hoehne, Peter; Hoisl, Johann; Kochanowski, Guenter; and Wimmer, Walter, 4,290,136, Cl. 371-25.000.
Kullmann, Dieter, 4,289,986, Cl. 310-61.000.
Stein, Karl U., 4,290,120, Cl. 365-205.000.
Vogelsberg, Dieter, 4,288,976, Cl. 57-293.000.
Woehrle, Patrick; Habock, Adolf; and Muller, Paul F., 4,290,108, Cl. 364-480.000.
Zemanek, Josef, 4,290,135, Cl. 370-110.000.
Zollner, Manfred; Hoffmann, Christian; and Zwicker, Eberhard, 4,289,935, Cl. 179-107.0FD.
Signode Corporation: *See—*
Crittenden, David E.; Angarola, Barry R.; Nix, Robert J.; and Meier, William A., 4,289,175, Cl. 140-93.400.
Massion, Robert J., 4,289,174, Cl. 140-93.400.
Sigri Elektrographit GmbH: *See—*
Kolling, Georg; Pietzka, Gerhard; Romey, Ingo; and Tillmanns, Harald, 4,289.604, Cl. 208-106.000.
Sih, John C., to Upjohn Company, The. 13,14-Didehydro-19-oxo-PGE_2compounds. 4,289,898, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Didehydro-19-oxo-PGE_1 analogs. 4,289,899, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-19-oxo-PGE_2 compounds. 4,289,900, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-19-oxo-PGF_1 compounds. 4,289,901, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 13,14-Dihydro-11-deoxy-19-oxo-PGE_1 compounds. 4,289,902, Cl. 562-503.000.
Sih, John C., to Upjohn Company, The. 19-Hydroxy-6a-carba-PGI_2 sulfonylamides. 4,289,904, Cl. 564-91.000.
Sih, John C.: *See—*
Axen, Udo F.; and Sih, John C., 4,289,893, Cl. 560-55.000.
Silec-Semi-Conducteurs: *See—*
Rossétti, Pierre C., 4,289,829, Cl. 428-469.000.
Simmonds Precision Products, Inc.: *See—*
Wallman, Irwin, 4,289,028, Cl. 73-304.00C.
Simons, Phillip R., to Imperial Chemical Industries Limited. Method of making laminates of thermoplastic polymers by a single-channel coextrusion process and melt injector block for use therein. 4,289,560, Cl. 156-244.180.
Simpson, Jack R., to Container Graphics Corporation. Creasing rule. 4,289,492, Cl. 493-371.000.
Sims, James O. Rotary pump assembly. 4,289,445, Cl. 415-113.000.
Sinay, Hanon S. Medical diagnostic computer. 4,290,114, Cl. 364-900.000.
Singer Company, The: *See—*
Dillon, Keith, 4,290,111, Cl. 364-768.000.
SINTEF (Selskapet for Industriell og Teknisk Forskning ved NTH): *See—*
Raaness, Ola S.; and Bakken, Jon A., 4,289,949, Cl. 219-121.0PR.
Sintokogio Ltd.: *See—*
Uzaki, Nagato; Kawamura, Yasutaro; Kaneto, Kimikazu; and Hasizume, Masaharu, 4,289,194, Cl. 164-170.000.
Skachkov, Jury V.: *See—*
Popov, Jury S.; Skachkov, Jury V.; Filippov, Iosif F.; and Khutoretsky, Gary M., 4,289,985, Cl. 310-61.000.
Slasor, James F.: *See—*
Barnes, Robin R.; Delves, Ronald F.; and Slasor, James F., 4,289,996, Cl. 318-38.000.
Slednev, Vladimir P.: *See—*
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.
Slongo, Mario: *See—*
Rody, Jean; and Slongo, Mario, 4,289,686, Cl. 260-45.8NT.
Smale, Terence C., to Beecham Group Limited. Polycyclic compounds. 4,289,696, Cl. 260-245.20T.
Smith, Chester L.; and Donnally, William, to United States of America, Army. Artillery training rounds target scoring system. 4,289,960, Cl. 250-222.00R.
Smith, Donald H.: *See—*
Repp, John R.; and Smith, Donald H., 4,289,328, Cl. 280-803.000.
Smith, Donald P. Microwave treatment of food products. 4,289,792, Cl. 426-241.000.
Smith, Frederick R., to Avtex Fibers Inc. High fluid-holding alloy rayon fiber mass. 4,289,824, Cl. 428-288.000.
Smith, Harry A. Golf club. 4,289,311, Cl. 273-167.00F.
Smith, Richard J.: *See—*
Thomas, Robert J.; and Smith, Richard J., 4,289,350, Cl. 297-172.000.
Smith, Robert L., to Emhart Industries, Inc. Voltage regulator circuit. 4,290,004, Cl. 323-311.000.
Smith, Roy E., to Urban Transportation Development Corporation Ltd. Steering articulated car. 4,289,075, Cl. 105-4.00R.
Smith, Stephen L., to Motorola, Inc. Apparatus for programming a dynamic EPROM. 4,289,982, Cl. 307-463.000.
Smulders, Hendricus F. G.: *See—*
Franken, Adrianus J. J.; Khoe, Giok D.; Kuyt, Gerard; Van Leest, Johannes H. F. M.; Nicia, Antonius J. A.; Potters, Cornelis J. T.; and Smulders, Hendricus F. G., 4,289,374, Cl. 350-96.200.
Smythe, Daniel L., Jr.: *See—*
Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., 4,290,118, Cl. 365-183.000.
Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.P.A.: *See—*
Leoni, Roberto; Baldini, Alberto; and Angelini, Gianfranco, 4,289,723, Cl. 264-187.000.
Snipes, Wallace: *See—*
Keith, Alec D.; and Snipes, Wallace, 4,289,749, Cl. 424-28.000.
Snow, Kenneth T., Jr.; and Snow, Robert N. Rigid steel brace for offset trusses. 4,288,961, Cl. 52-738.000.
Snow, Robert N.: *See—*
Snow, Kenneth T., Jr.; and Snow, Robert N., 4,288,961, Cl. 52-738.000.
Soch, Fredrich A., to Minnesota Mining and Manufacturing Company. Fluorochemical foam stabilizer and foamed polyurethanes made therewith. 4,289,892, Cl. 560-26.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Saba, Manlio; and Szocs, Roberto, 4,290,145, Cl. 455-113.000.
S.A. Andre Boet: *See—*
Magnani, Michel; and Moulin, Michel, 4,290,054, Cl. 340-384.00E.
Societe Anonyme dite: L'Oreal: *See—*
Mahieu, Claude; and Papantoniou, Christos, 4,289,752, Cl. 424-47.000.
Societe Anonyme Francaise du Ferodo: *See—*
Cadars, Patrick; and Hellouin di Cenival, Bruno, 4,289,507, Cl. 55-195.000.
Societe Chimique des Charbonnages-CdF Chimie: *See—*
Levresse, Bernard, 4,289,512, Cl. 55-315.000.
Societe d'Etudes de Machines Thermiques S.E.M.T.: *See—*
Curtil, Remi, 4,288,988, Cl. 60-605.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Declerco, Marc A.; and Margant, Gerard, 4,289,448, Cl. 416-140.000.
Societe Nationale Industrielle et Aerospatiale: *See—*
Lecourt, Guy B. E.; and Portalier, Claude L. L., 4,289,168, Cl. 138-109.000.
Soft Bathtub Company, The: *See—*
Bortz, Wayne E., 4,289,717, Cl. 264-46.500.

Sohval, A. Robert: *See*—
Cooperstein, Gerald; Lanza, Richard C.; and Sohval, A. Robert, 4,289,969, Cl. 250-445.00T.

Soloptics, Inc.: *See*—
Meyer, Donald R., Sr., 4,289,119, Cl. 126-440.000.

Solyanichenko, Nikolai A.: *See*—
Stakhov, Alexei P.; Kozak, Andrei A.; Solyanichenko, Nikolai A.; Kuzmin, Ivan V.; and Azarov, Alexei D., 4,290,051, Cl. 340-347.0DD.

Somfai, Eva: *See*—
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth, Zoltan, 4,289,894, Cl. 560-82.000.

Sony Corporation: *See*—
Hirai, Jun, 4,290,082, Cl. 358-8.000.
Kubota, Shigeo; Ishihara, Tadao; and Kikuchi, Masahiro, 4,289,400, Cl. 356-376.000.
Sakamoto, Hitoshi; and Takano, Kazuhiro, 4,289,284, Cl. 242-186.000.

Sorber, Robert E.; and Gallion, James A., to Keane Monroe Corporation. Electric door operator with slip clutch and dynamic braking. 4,289,995, Cl. 318-9.000.

Soundesign Corporation: *See*—
Yamamoto, Ryuji; and Ohsawa, Kiyotaka, 4,290,090, Cl. 360-72.100.

South African Inventions Development Corporation: *See*—
Vinopal, George W., 4,289,037, Cl. 73-808.000.

Span-Deck, Inc.: *See*—
Cashion, Jerry L., 4,289,293, Cl. 249-74.000.

Spatz, David M.; and Cross, Barrington, to American Cyanamid Company. Para-phenylalkoxy phenylurea and thiourea compounds and herbicidal use thereof. 4,289,903, Cl. 564-20.000.

Specht, Donald P.; Houle, Conrad G.; and Farid, Samir Y., to Eastman Kodak Company. Photopolymerizable compositions featuring novel co-initiators. 4,289,844, Cl. 430-281.000.

Speed Queen Company: *See*—
Altnau, Ronald L., 4,289,320, Cl. 277-67.000.

Speeflo Manufacturing Corporation: *See*—
Malcolm, David H., 4,290,091, Cl. 361-228.000.

Speicher, Wolfgang: *See*—
Noll, Klaus; Speicher, Wolfgang; Pedain, Josef; and Schmid, Rosemarie, 4,289,827, Cl. 428-423.400.

Spence, William G. Multi-purpose vehicle. 4,289,214, Cl. 180-234.000.

Spencer, David R.; and Zuckerman, Leonard, to Litton Systems, Inc. First grate detector for an optical scanning system. 4,290,086, Cl. 358-293.000.

Spencer Wright Industries, Inc.: *See*—
Stoker, James E.; and Powell, John C., 4,289,082, Cl. 112-79.00R.

Sperry Corporation: *See*—
Boirin, Jean-Claude A. E.; and Guenon, Jean-Pierre, 4,289,435, Cl. 414-39.000.
McClure, John R., 4,288,971, Cl. 56-341.000.
Underhill, Kenneth R., 4,288,969, Cl. 56-10.200.
Zipser, Randall E.; and Stringfellow, H. Berton, 4,289,436, Cl. 414-76.000.

Spiegel, Rene, to Sandoz Ltd. Methods of treating sleep disturbance. 4,289,780, Cl. 424-267.000.

Spin Physics, Inc.: *See*—
Bixby, James A.; and Lentz, Robert A., 4,290,087, Cl. 360-33.000.

Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries, Inc. Replaceable harness bracket assembly. 4,289,286, Cl. 244-1.00R.

Spolgen, Herman J.: *See*—
Schotten, Alfons; Spolgen, Herman J.; and Rilling, Ulrich, 4,289,618, Cl. 210-142.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Use of 2,4,6-trimethylcyclohexanemethanol and derivatives for augmenting or enhancing the aroma or taste of smoking tobacco and smoking tobacco articles. 4,289,146, Cl. 131-276.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 2-Oxabicyclooctane derivative, processes for preparing same and organoleptic uses thereof. 4,289,705, Cl. 260-345.100.

Spring, Carl E., to La Crosse Cooler Company. Article dispenser with cam actuated gate. 4,289,254, Cl. 221-295.000.

Square D Company: *See*—
Jurek, Dennis J.; Guettel, Marvin A.; and Aslin, Michael, 4,289,948, Cl. 219-110.000.
Jurek, Dennis J., 4,289,951, Cl. 219-110.000.

Squires, David R., to Intersil, Inc. Four terminal voltage tripler for monolithic LCD clock circuit. 4,290,100, Cl. 363-60.000.

Stakhov, Alexei P. Digital-analog converter utilizing fibonacci series. 4,290,050, Cl. 340-347.0DA.

Stakhov, Alexei P.; Kozak, Andrei A.; Solyanichenko, Nikolai A.; Kuzmin, Ivan V.; and Azarov, Alexei D. Device for reducing irrational-base codes to minimal form. 4,290,051, Cl. 340-347.0DD.

Stamp, Thomas B. Accumulator plate assembly methods. 4,289,193, Cl. 164-109.000.

Standard Oil Company, The: *See*—
Benton, Kenneth C.; Mooney, James R.; and Weinert, Raymond J., Jr., 4,289,651, Cl. 252-429.00B.
Li, George S., 4,289,668, Cl. 260-23.0AR.

Standard Oil Company (Indiana): *See*—
Bockrath, Ronald E., 4,289,874, Cl. 528-487.000.
Donohue, John A.; and Paschke, Edward E., 4,289,870, Cl. 528-193.000.
Kiehn, Robert M., 4,289,404, Cl. 356-351.000.

Stanwood, Jay W.; Clarke, William A.; and MacLeane, Johannes, to Ford Aerospace & Communications Corp. Method for mass producing composite shafts. 4,289,557, Cl. 156-171.000.

Stark, Virgil, to North American Utility Construction Corp. Solar energy system with pivoting lens and collector and conduit system therefor. 4,289,118, Cl. 126-440.000.

Steele, Charles P.: *See*—
Edgell, Thomas A.; Foote, Alfred R.; and Steele, Charles P., 4,289,072, Cl. 102-318.000.

Steele, Roger K.: *See*—
Long, Lennart E.; Steele, Roger K.; Coleman, David F.; and Gustafson, Ralph A., 4,288,926, Cl. 33-174.00P.

Steele, Thomas L., to Schmitz, John S.; and Theobald, Roger W. Apparatus for forming a universal chase top. 4,289,008, Cl. 72-83.000.

Stein, Karl U., to Siemens Aktiengesellschaft. Circuit arrangement for reading out and regenerating items of information stored in one-transistor storage elements. 4,290,120, Cl. 365-205.000.

Stein, Reinhardt P., to American Home Products Corporation. 3-[2-(Dimethylamino)-2-phenylethyl]N-[phenylamino)carbonyl]sydnone imine, a new central nervous system stimulant. 4,289,885, Cl. 548-125.000.

Steinberg, Mitchell I.: *See*—
Molloy, Bryan B.; and Steinberg, Mitchell I., 4,289,787, Cl. 424-329.000.

Steinhauer, Roger C.; and Gabriel, Isabelle M., to Armour-Dial, Inc. Pre-wash stick cleaner. 4,289,644, Cl. 252-127.000.

Stelben, John J., to Pitney Bowes, Inc. Copy sheet deflector for an electrophotographic copier. 4,289,395, Cl. 355-3.0BE.

Stephens, Charles R.: *See*—
Gruetsmacher, Gordon D.; and Stephens, Charles R., 4,289,702, Cl. 260-343.700.

Stephens, Geoffrey B.: *See*—
Alcorn, George E.; Hamaker, Raymond W.; and Stephens, Geoffrey B., 4,289,834, Cl. 428-601.000.

Stepp, James D., to BASF Wyandotte Corporation. Solvent stable copper phthalocyanine blue pigments. 4,289,698, Cl. 260-314.500.

Sterling Drug, Inc.: *See*—
Knopp, Paul V.; and Burant, Walter, Jr., 4,289,626, Cl. 210-616.000.

Sterling, Larry D.; and Melvin, Wilbert, Jr., to International Playtex, Inc. Apparatus to lessen the entanglement of tubular fabrics. 4,288,999, Cl. 68-13.00R.

Sterling Merchandise Co.: *See*—
Harris, Ronald J., 4,288,948, Cl. 52-28.000.

Sterman, Albert P.; Gay, Charles H., Jr.; Tegarden, Frederick W.; and Lenahan, Dean T., to General Electric Company. Metal-ceramic turbine shroud and method of making the same. 4,289,447, Cl. 415-200.000.

Stern, Donald J., to Allsop Automatic, Inc. Method for heating ski boots. 4,288,928, Cl. 36-2.600.

Stern, Ernest R.; Ralston, Richard W.; Smythe, Daniel L., Jr.; and Burke, Barry E., to Massachusetts Institute of Technology. Solid state devices combining the use of surface-acoustic-wave devices and charge-coupled devices. 4,290,118, Cl. 365-183.0A0.

Sternberg, Stanley R.; Lougheed, Robert M.; and Dargel, William O., to Environmental Research Institute of Michigan. Dynamic data correction generator for an image analyzer system. 4,290,049, Cl. 340-146.3MA.

Stettler, Wayne J.: *See*—
Seibel, Paula; and Stettler, Wayne J., 4,289,232, Cl. 206-37.000.

Stevens, James L. Boom lift load relief. 4,289,442, Cl. 414-629.000.

Stewart, Hudson: *See*—
Tacke, Kenneth L.; Galbraith, Lyle D.; and Stewart, Hudson, 4,289,089, Cl. 118-306.000.

Stewart, Orvel L., to Sun Tech Energy Corporation. Solar heat treating of well fluids. 4,289,204, Cl. 166-303.000.

Stewart, Robert E.; Flahive, Barry J.; and Potter, David, to Digital Equipment Corporation. System timing means for data processing system. 4,290,133, Cl. 370-85.000.

Stewart, Robert E.: *See*—
Levy, John V.; Rodgers, David; Stewart, Robert E.; and Casabona, Richard J., 4,290,102, Cl. 364-200.000.

Stockton, Raymond F. Terrestrial magnetism responsive method and device including a soft iron bar on a free end of a magnet. 4,288,927, Cl. 33-355.00R.

Stoker, James E.; and Powell, John C., to Spencer Wright Industries, Inc. Knife block for tufting machines. 4,289,082, Cl. 112-79.00R.

Stolle Corporation, The: *See*—
Kaminski, Elton G., 4,289,231, Cl. 198-834.000.

Stolyar, Genrikh L.: *See*—
Khmelevskaya, Elena D.; Dvoskin, Grigory I.; Kablikov, Vladislav A.; Chukhanov, Zinovy F.; Volny, Vadim M.; Mukhina, Tamara N.; Stolyar, Genrikh L.; Volnaya, Olga E.; and Kuptsov, Nikolai F., 4,289,731, Cl. 422-206.000.

Stone, Arthur F. Scrubbing apparatus. 4,289,506, Cl. 55-92.000.

Stop-A-Flat Corporation: *See*—
Dubow, Jerome, 4,289,805, Cl. 427-140.000.

Storar, Robert C.: *See*—
Fisher, Bernard; and Storar, Robert C., 4,290,007, Cl. 323-270.000.

Storck, Glenn E., to Thomas & Betts Corporation. Flat conductor cable electrical conductor junction means. 4,289,370, Cl. 339-125.00R.

Strampe, Clarence W. Oil filter cap. 4,289,255, Cl. 222-81.000.

Streckenbach, Wulf-Christian, to Licentia Patent-Verwaltungs-G.m.b.H. Digital phase control circuit including an auxiliary circuit. 4,290,029, Cl. 331-1.00A.

Strehler, Richard; and Bartl, Max, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Shiftable friction clutch for gear drives. 4,289,223, Cl. 192-48.910.

Stringfellow, H. Berton: *See*—
Zipser, Randall E.; and Stringfellow, H. Berton, 4,289,436, Cl. 414-76.000.

Strobel, Gunther: *See*—
Disselbeck, Dieter; Neumann, Gerhard; Ott, Karl-Heinz; Strobel, Gunther; and Zalewski, Edwin, 4,289,627, Cl. 210-702.000.

Strom, Richard A.; Bergman, Clark; and Michalek, Paul F., to Control Data Corporation. Plasma display panel flexible circuit connection. 4,289,364, Cl. 339-17.0CF.

Studsvik Energiteknik AB: *See*—
Roseen, Rutger A., 4,289,112, Cl. 126-415.000.

Suchanek, Walton F., Jr.: *See*—
Dyroff, David R.; Graf, Gary F.; Kim, Keun Y.; and Suchanek, Walton F., Jr., 4,289,753, Cl. 424-48.000.

Suda, Seiji; Hasegawa, Taiji; Mouri, Yasunori; and Furuhashi, Toshio, to Hitachi, Ltd. Electronic fuel control system for an internal combustion engine. 4,290,107, Cl. 364-431.000.

Sueishi, Motoharu: *See*—
Kinugawa, Masumi; Omori, Norio; and Sueishi, Motoharu, 4,289,100, Cl. 123-339.000.

Sugawara, Hidetoshi: *See*—
Inagawa, Takashi; Kushida, Naoto; Sekiguchi, Akira; Ikeda, Matujiro; Sugawara, Hidetoshi; and Naito, Kunio, 4,290,037, Cl. 335-202.000.

Sugie, Mamoru; Yamaguchi, Noboru; Mayama, Koichi; Kita, Yuzo; Yoshizawa, Shigeru; Saito, Nobuo; and Asano, Atsushi, to Hitachi, Ltd. Memory device with circulating storage loops. 4,290,117, Cl. 365-15.000.

Sugimoto, Shigetoki; and Minemura, Kouichi, to Nippon Electric Co., Ltd. Bidirectional optical fiber transmission system. 4,289,373, Cl. 350-96.160.

Sullivan, Thomas P.: *See*—
Gleason, Joseph P., 4,290,065, Cl. 340-870.430.

Sumitomo Chemical Company, Limited: *See*—
Fukasawa, Akira; Masaki, Shinzaburo; and Serizawa, Norio, 4,289,706, Cl. 260-369.000.

Sumitomo Electric Industries, Ltd.: *See*—
Ishise, Kojiro, 4,289,721, Cl. 264-85.000.

Sumitomo Rubber Industries, Inc.: *See*—
Tominaga, Ichiro; and Sasaki, Teruo, 4,289,032, Cl. 73-599.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Tominaga, Ichiro; and Sasaki, Teruo, 4,289,031, Cl. 73-597.000.

Sumpter, Floyd H. Apparatus for supporting macrame during formation of a particular article. 4,289,341, Cl. 289-16.500.

Sun, Kai C. K., to Xerox Corporation. Power amplifier with current limiter circuit. 4,290,000, Cl. 318-566.000.

Sun Tech Energy Corporation: *See*—
Stewart, Orvel L., 4,289,204, Cl. 166-303.000.

Suncor Inc.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,289,540, Cl. 127-33.000.

Suntech, Inc.: *See*—
Clark, Leland C., Jr.; and Moore, Robert E., 4,289,499, Cl. 23-230.00B.

Supcoe, Robert F.; and Greenberg, Melvin. Formulation for producing low infrared coating in the 2-15 micron range. 4,289,677, Cl. 260-33.6SB.

Sutherland, Robert J.: *See*—
Hutchison, James M. S.; Mallard, John R.; and Sutherland, Robert J., 4,290,019, Cl. 324-311.000.

Suzuki, Katsumi: *See*—
Mayumi, Kazuhisa; Suzuki, Katsumi; and Tsuboi, Fujio, 4,289,990, Cl. 313-143.000.

Suzuki, Keiichi: *See*—
Saito, Hirokazu; Suzuki, Keiichi; Shimizu, Masayuki; and Miyahara, Junji, 4,289,733, Cl. 422-227.000.

Suzuki, Osamu: *See*—
Yoshida, Yoshiaki; Suzuki, Osamu; Onoue, Keiji; and Seiki, Kazuo, 4,288,975, Cl. 57-263.000.

Suzuki, Tomosaburo, to Kabushiki Kaisha Daisei Kikai. Sprouting beans refinement apparatus. 4,289,614, Cl. 209-308.000.

Svedala-Arbra AB: *See*—
Lindberg, Ernst R., 4,288,904, Cl. 29-426.300.

Svenska Traforskningsinstitutet: *See*—
Johansson, Ingvar K. G., 4,289,663, Cl. 260-17.500.

Svenson, Bruce E. Metal treatment. 4,289,638, Cl. 252-85.000.

Swanson, Billy L., to Phillips Petroleum Company. Oil displacement method using shear-thickening compositions. 4,289,203, Cl. 166-274.000.

Swiss Aluminium Ltd.: *See*—
Festag, Werner; and Muller, Hans-Ueli, 4,289,009, Cl. 72-60.000.
Mueller, Hans P.; Alder, Hanspeter; and Zhuber-Okrog, Gerhard, 4,289,735, Cl. 423-136.000.

Swistun, Gwido K. Sawdust furnace. 4,289,079, Cl. 110-255.000.

Switall, Thomas G., to Ryco Graphic Manufacturing, Inc. Non-drip fluid delivery system. 4,289,167, Cl. 137-869.000.

SWS Silicones Corporation: *See*—
Martin, Eugene R., 4,289,867, Cl. 528-12.000.

Sylvester, Robert A., to Eastman Kodak Company. Instant processing sleeve for borderless prints. 4,289,840, Cl. 430-207.000.

Symeonidis, Ioannis. Sunroof. 4,289,349, Cl. 296-213.000.

Syntron, Inc.: *See*—
Cole, Jimmy R., 4,290,124, Cl. 367-18.000.

System Development Corporation: *See*—
Pitt, Paul E.; Glaser, Edward L.; and Galie, Louis M., 4,290,115, Cl. 364-900.000.

Szabo, Gabor: *See*—
Huhn, Magda; Somfai, Eva; Szabo, Gabor; Resovszki, Gabor; and Gneth, Zoltan, 4,289,894, Cl. 560-82.000.

Szocs, Roberto: *See*—
Saba, Manlio; and Szocs, Roberto, 4,290,145, Cl. 455-113.000.

Szpur, Roman. Light fixture. 4,290,096, Cl. 362-223.000.

Tacke, Kenneth L.; Galbraith, Lyle D.; and Stewart, Hudson, to Rocket Research Corporation. Tire sealant applicator. 4,289,089, Cl. 118-306.000.

Tacklind, Thomas A.: *See*—
McChesney, John L.; and Tacklind, Thomas A., 4,289,092, Cl. 118-660.000.

Tadmor, Zehev: *See*—
Hold, Peter; and Tadmor, Zehev, 4,289,319, Cl. 277-59.000.

Takada, Shigetaka; Nomura, Masaaki; and Itoh, Manabu, to Aisan Industry Co., Ltd. Air-fuel mixture supplying device for internal combustion engines. 4,289,104, Cl. 123-471.000.

Takagi, Yasuo: *See*—
Katsumata, Masaaki; Onoda, Michio; Takagi, Yasuo; and Yoneda, Kenji, 4,289,102, Cl. 123-425.000.

Takano, Kazuhiro: *See*—
Sakamoto, Hitoshi; and Takano, Kazuhiro, 4,289,284, Cl. 242-186.000.

Takano, Teruhisa: *See*—
Murase, Fujio; Matsumoto, Hidenosuke; Fujieda, Hiroshi; Takano, Teruhisa; and Imasu, Kenichiro, 4,289,272, Cl. 236-91.00D.

Takaoka, Saburo; and Higashi, Ryozi, to Pioneer Electronic Corporation. Tone control arrangement for use in sound reproducing instruments. 4,289,928, Cl. 179-1.00D.

Takasue, Takashi: *See*—
Matsui, Kazumi; Takasue, Takashi; and Iwasaki, Masami, 4,289,227, Cl. 198-334.000.

Takayama, Shuichi; Tsuboshima, Kosaku; Nakajima, Yoshio; Iwasawa, Teruo; and Yamazaki, Masafumi, to Olympus Optical Company Limited. Apparatus for detecting the in-focusing conditions. 4,289,959, Cl. 250-201.000.

Takenoya, Hideaki; and Tonomura, Yoshinobu, to Janome Sewing Machine Co., Ltd. Sewing machine with stitch type identifying device. 4,289,084, Cl. 112-158.00E.

Takenoya, Hideaki; Watanabe, Kazuo; Nakagawa, Tamotsu; and Tonomura, Yoshinobu, to Janome Sewing Machine Co., Ltd. Sewing machine with thread-tension control system. 4,289,087, Cl. 112-254.000.

Taketoshi, Kazuhisa, to Nippon Hoso Kyokai. Exchangeable Ga-Cu electrode for an evaporation system. 4,289,369, Cl. 339-118.00R.

Takeuchi, Haruo, to Olympus Optical Co., Ltd. Endoscope sheath cleaning device. 4,288,882, Cl. 15-88.000.

Tamamushi, Masahiro; and Katakura, Kazuo, to Nissan Motor Company, Limited. Luggage compartment cover apparatus for an automotive vehicle. 4,289,345, Cl. 296-37.160.

Tan, Zoilo C. H.; Petropoulos, Constantine C.; and Rauner, Frederick J., to Eastman Kodak Company. Negative-working polymers useful as electron beam resists. 4,289,842, Cl. 430-270.000.

Tanahashi, Toshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Two-stroke cycle gasoline engine. 4,289,094, Cl. 123-69.00R.

Tanaka, Osamu; Nakano, Nobuo; and Fukui, Toyoaki, to Tanaka, Osamu. Magnetic loop antenna with diamagnetic properties. 4,290,070, Cl. 343-788.000.

Tani, Fedora, to Chenil Cont GS S.R.L. Machine for producing chenille yarn. 4,288,973, Cl. 57-24.000.

Taniguchi, Koichi; Katayama, Minoru; Sangu, Osamu; and Hori, Shinichi, to Nippondenso Co., Ltd. Electric monitoring method and apparatus for electric system of automotive vehicle. 4,290,109, Cl. 364-481.000.

Tanikawa, Sakuichi: *See*—
Matsuda, Tamio; and Tanikawa, Sakuichi, 4,288,903, Cl. 29-416.000.

Tanoue, Junichi: *See*—
Shirai, Kenji; Shimizu, Hidetoshi; and Tanoue, Junichi, 4,289,216, Cl. 188-72.200.

Tansei, Hikaru: *See*—
Motomura, Kenichi; Tansei, Hikaru; and Abe, Masaru, 4,289,184, Cl. 152-354.00R.

Tarman, Paul B.; and Chynoweth, David P., to Institute of Gas Technology. Hybrid bio-thermal gasification. 4,289,625, Cl. 210-603.000.

Taylor, Leslie L., Jr.: *See*—
Killmeyer, Charles W., deceased; Lane, James E.; Taylor, Leslie L., Jr.; and Pearson, Joe T., 4,289,465, Cl. 425-111.000.

TDK Electronics Co. Ltd.: *See*—
Ishida, Toshihiko; and Satou, Takateru, 4,289,285, Cl. 242-199.000.
Ota, Hiroshi; Horigome, Eiji; and Azegami, Hitoshi, 4,289,828, Cl. 428-425.900.

Technical Development LTD: *See*—
Furney, Douglas E.; and Muldrey, Michael J., 4,290,055, Cl. 340-518.000.

Technics, Inc.: *See*—
Engle, Frank W., 4,289,598, Cl. 204-192.00E.

Tegarden, Frederick W.: *See*—
Sterman, Albert P.; Gay, Charles H., Jr.; Tegarden, Frederick W.; and Lenahan, Dean T., 4,289,447, Cl. 415-200.000.

Teichmann, Michael: *See*—
Jung, Bernhard; and Teichmann, Michael, 4,289,997, Cl. 318-113.000.

Tekniska Rontgencentralen AB: *See—*
Nordenstrom, Bjorn; and Olsson, Jerker, 4,289,135, Cl. 128-419.00R.
Teletype Corporation: *See—*
Heeren, Richard H., 4,288,910, Cl. 29-571.000.
Terkelsen, Bruce E., to United Technologies Corporation. Seed and method for epitaxial solidification. 4,289,570, Cl. 164-122.100.
Terra Tek, Inc.: *See—*
Barker, Lynn M., 4,289,036, Cl. 73-799.000.
Teubner, Ehrhardt, to Schubert & Salzer. Spark chamber for a vacuum emission spectrometer. 4,289,402, Cl. 356-313.000.
Texaco Development Corporation: *See—*
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,289,502, Cl. 48-62.00R.
Texaco Inc.: *See—*
Eng, King D.; Brandenburg, John T.; Lee, Kung-You; and McMahon, Matthew A., 4,289,810, Cl. 427-230.000.
Estes, John H., 4,289,740, Cl. 423-328.000.
Paap, Hans J., 4,289,020, Cl. 73-61.10R.
Texas Instruments Incorporated: *See—*
Beecroft, Harold J., 4,290,088, Cl. 360-66.000.
Boone, Gary W.; and Cochran, Michael J., 4,290,121, Cl. 365-233.000.
Texasgulf Inc.: *See—*
Schrieber, Glenn H., 4,289,612, Cl. 209-166.000.
Textron, Inc.: *See—*
Hunke, Siegfried H., 4,289,013, Cl. 72-243.000.
Theobald, Roger W.: *See—*
Steele, Thomas L., 4,289,008, Cl. 72-83.000.
Theron, Jacob J.; Bout, Bernardus J.; Van Wyk, Jacobus P.; and De Lange, Michael D. Battery testing method and device. 4,290,021, Cl. 324-429.000.
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., to Association pour la Recherche et le Developpement des Methodes et Processus Industriels (ARMINES). Process for the boronizing of pieces made of metal or cermet. 4,289,545, Cl. 148-6.300.
Thewalt, Klaus: *See—*
Burkhardt, Rudolf; Meyer, Gunther; Schmidt, Reinhard; and Thewalt, Klaus, 4,289,895, Cl. 560-92.000.
Thiel, David W., to GenRad, Inc. Method of and apparatus for electrical short testing and the like. 4,290,013, Cl. 324-73.0PC.
Thiery, Joachim: *See—*
Haker, Rolf; Fuhrer, Heinz-Georg; van Rijckevorsel, Rainer; Ruhl, Werner; and Thiery, Joachim, 4,290,113, Cl. 364-900.000.
Thigpen, Hubert H.: *See—*
Harris, Marvin E., Jr.; and Thigpen, Hubert H., 4,289,912, Cl. 568-422.000.
Scott, Robert H.; Thigpen, Hubert H.; and Wood, Frank, Jr., 4,289,708, Cl. 260-413.000.
Think, Inc.: *See—*
Gaetano, Ralph R., 4,289,333, Cl. 283-35.000.
Thogersen, Hans P.: *See—*
Friesen, Eckart; Thogersen, Hans P.; and Kuhnel, Roland, 4,288,997, Cl. 62-434.000.
Thomas & Betts Corporation: *See—*
Storck, Glenn E., 4,289,370, Cl. 339-125.00R.
Thomas, Robert J.; and Smith, Richard J. Combined folding table and seat. 4,289,350, Cl. 297-172.000.
Thomas, Ross T. Exercise wheel. 4,289,306, Cl. 272-33.00R.
Thomas, Stephen, to Edwin Burgess Limited. System for identifying solid dosage units. 4,289,958, Cl. 235-489.000.
Thompson, John H.: *See—*
Geil, Fred G.; and Thompson, John H., 4,290,035, Cl. 333-186.000.
Thompson, Larry F.: *See—*
Bowden, Murrae J. S.; and Thompson, Larry F., 4,289,845, Cl. 430-296.000.
Thompson, Michael Q.: *See—*
Cichelli, Richard J.; Thompson, Michael Q.; and Cheswick, William R., 4,290,105, Cl. 364-200.000.
Thompson, Robert B.: *See—*
Aiers, George A.; Thompson, Robert B.; and Vasile, Carmine F., 4,289,030, Cl. 73-588.000.
Thompson, Tom; and Hirschberg, Kenneth A., to LITE-A-GUIDE, Inc. Portable illuminated magazine case. 4,290,093, Cl. 362-98.000.
Thomson, Arthur E.: *See—*
Hanaford, Donald E.; and Oldham, Dale R., 4,289,564, Cl. 156-425.000.
Thomson-CSF: *See—*
Berte, Marc; and Legrand, Pierre, 4,290,012, Cl. 324-71.0EB.
Thorberg, Seth O.: *See—*
Bengtsson, Karl S.; Thorberg, Seth O.; and Ogren, Sven O., 4,289,781, Cl. 424-267.000.
Thorne Industries, Inc.: *See—*
Scholta, Owen R., 4,289,225, Cl. 194-9.00T.
Tikhonov, Valentin N.; Zhestkov, Vitaly I.; Shlykov, Gennady N.; Diachkov, Vasily M.; Mukhin, Viktor M.; and Zhigalov, Gennady V. Apparatus for drafting fibers. 4,288,889, Cl. 19-236.000.
Tillinghast, Roberta K.: *See—*
Edgell, Thomas A.; Foote, Alfred R.; and Steele, Charles P., 4,289,072, Cl. 102-318.000.
Tillmanns, Harald: *See—*
Kolling, Georg; Pietzka, Gerhard; Romey, Ingo; and Tillmanns, Harald, 4,289,604, Cl. 208-106.000.
Timex Corporation: *See—*
Lowdenslager, John; and Zatsky, Norman C., 4,290,130, Cl. 368-200.000.
Schwarzschild, Jack, 4,289,383, Cl. 350-334.000.
Tippmer, Kurt, to Carl Still GmbH & Co. KG, Firma. Method of producing process gases containing hydrogen and carbon monoxide from ash oil. 4,289,647, Cl. 252-373.000.
Tjoeng, Foe-Siong: *See—*
Heavner, George; Tjoeng, Foe-Siong; and Goldstein, Gideon, 4,289,759, Cl. 424-177.000.
Tobias, Philip E. Color monitoring system for use in creating colored displays. 4,289,405, Cl. 356-407.000.
Tochizawa, Ikuo, to Kabushiki Kaisha Fujikoshi. AC Solenoid apparatus of the armature in tube type. 4,290,039, Cl. 335-262.000.
Tokai Seiki Co., Ltd.: *See—*
Nitta, Tomio, 4,289,478, Cl. 431-344.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Sakamoto, Junji; and Kishi, Hiroyasu, 4,289,981, Cl. 307-350.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Enjoji, Susumu; and Saito, Koji, 4,289,139, Cl. 128-660.000.
Yamanaka, Junichi; Nakamura, Noboru; Fujiki, Hirokazu; and Miyaji, Yoshimori, 4,290,038, Cl. 335-214.000.
Tolbert, William R.; Hitt, Mary M.; and Feder, Joseph, to Monsanto Company. Cell culture method and apparatus. 4,289,854, Cl. 435-241.000.
Tolpa, Anatoly A.: *See—*
Chumanov, Julian M.; Liberman, Anatoly L.; Listopad, Vladimir I.; Polyakov, Vasily V.; Gubaidulin, Vyacheslav F.; Shulgin, Grigory M.; Evteev, Dmitry P.; Efimenko, Sergei P.; Fulmakht, Veniamin V.; Slednev, Vladimir P.; Pogorzhelsky, Viktor I.; Shum, Valentin B.; and Tolpa, Anatoly A., 4,288,907, Cl. 29-527.600.
Tomcufcik, Andrew S.: *See—*
Wright, William B., Jr.; and Tomcufcik, Andrew S., 4,289,769, Cl. 424-248.560.
Tominaga, Ichiro; and Sasaki, Teruo, to Sumitomo Rubber Industries, Ltd. Method of measuring hardness of flexible thread-wound golf balls or inner cores thereof. 4,289,031, Cl. 73-597.000.
Tominaga, Ichiro; and Sasaki, Teruo, to Sumitomo Rubber Industries, Inc. Method of discriminating kinds of golf balls. 4,289,032, Cl. 73-599.000.
Tominaga, Michiaki; Tone, Hitoshi; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Carbostyril compounds. 4,289,883, Cl. 546-158.000.
Tomlinson, Ronald S., to Heil-Quaker Corporation. Furnace with flue gas condensate neutralizer. 4,289,730, Cl. 422-178.000.
Tomoe Technical Research Company: *See—*
Nakanishi, Mikimaro, 4,289,297, Cl. 251-306.000.
Tone, Hitoshi: *See—*
Tominaga, Michiaki; Tone, Hitoshi; and Nakagawa, Kazuyuki, 4,289,883, Cl. 546-158.000.
Tonomura, Yoshinobu: *See—*
Takenoya, Hideaki; and Tonomura, Yoshinobu, 4,289,084, Cl. 112-158.00E.
Takenoya, Hideaki; Watanabe, Kazuo; Nakagawa, Tamotsu; and Tonomura, Yoshinobu, 4,289,087, Cl. 112-254.000.
Topolski, Francis J.: *See—*
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Tortorello, Anthony J., to American Can Company. Ambient temperature curing photopolymerizable epoxide compositions utilizing epoxide ethers and methods. 4,289,595, Cl. 204-159.110.
Tovey, John M.: *See—*
Maeder, Edward G.; and Tovey, John M., 4,289,014, Cl. 72-348.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Mabuchi, Katsuya; and Yamamoto, Shigeyuki, 4,289,577, Cl. 159-5.000.
Toyo Rubber Industry Co., Ltd., The: *See—*
Yamamoto, Masaki; and Azuma, Ichiro, 4,289,856, Cl. 521-51.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Munekata, Kenichi; Fujita, Michio; and Hattori, Yasuhiro, 4,288,945, Cl. 51-238.00S.
Toyota Jidosha Kogyo Kabushiki: *See—*
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Nomura, Yoshihisa, 4,289,162, Cl. 137-572.000.
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Trotsky, Alex; and Brimmer, Alan, to Arnold Engineering Company. Apparatus for automated application of heat sensitive tape. 4,289,568, Cl. 156-518.000.
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Turner, Roger S. Injection site apparatus. 4,289,129, Cl. 128-214.00G.
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Kindig, James K.; and Turner, Ronald L., 4,289,529, Cl. 75-1.00R.
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Herdle, William B.; Kanner, Bernard; and Bailey, Donald L., 4,289,889, Cl. 556-470.000.
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Kuenzly, John D. Low thrust monopropellant engine. 4,288,982, Cl. 60-200.00R.
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Pickens, George O., 4,290,123, Cl. 367-13.000.
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U.S. Philips Corporation: *See—*
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Usami, Akira; Uebayashi, Toshiaki; Sato, Koji; and Goda, Tomoko, to Daicel Ltd.; and Fuji Sanitary Industries Co., Ltd. Absorbent material for sanitary products. 4,289,130, Cl. 128-287.000.

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Utsumi, Kazuaki; Shohata, Nobuaki; and Ohno, Tomeji, to Nippon Electric Co., Ltd. Voltage dependent nonlinear resistor. 4,290,041, Cl. 338-21.000.

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Valyi, Emery I. Decorated multilayered hollow plastic container. 4,289,817, Cl. 428-35.000.

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van de Plassche, Rudy J., to U.S. Philips Corporation. Amplifier arrangement with variable gain factor. 4,290,025, Cl. 330-254.000.

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Vogelsberg, Dieter, to Siemens Aktiengesellschaft. Apparatus for the SZ-twisting of power cable conductors with sector-shaped conductor cross section. 4,288,976, Cl. 57-293.000.

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Voigt, Hermann U., to Kabel- und Metallwerke Gutehoffnungshutte A.G. Thermally insulating tubes. 4,289,716, Cl. 264-45.900.

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Von Schriltz, Don F. Rotary die anvil. 4,289,055, Cl. 83-659.000.

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Vuletich, William: *See—*
Mason, Randy D. F.; and Vuletich, William, 4,289,122, Cl. 128-80.00E.

Wagener, Dietrich; Flockenhaus, Claus; and Blase, Manfred, to Didier Engineering GmbH. Method and apparatus for the wet quenching of coke. 4,289,585, Cl. 202-227.000.

Waggonfabrik Uerdingen AG: *See—*
Brand, Werner; Zavadil, Jaroslav; and Heuer, Wolfgang, 4,289,247, Cl. 213-20.000.

Wagner, Karl: *See—*
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Wahl, Roger L.: *See—*
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Wahls, Robert J., to Freedman Seating Company, The. Low profile truck seat. 4,289,351, Cl. 297-307.000.

Waites, William M.: *See—*
Peel, John L.; and Waites, William M., 4,289,728, Cl. 422-24.000.

Wakabayashi, Hiroshi; and Ohtsubo, Yoshiaki, to Nippon Kogaku K.K. Automatic focus adjusting device of a camera having a self-timer. 4,289,388, Cl. 354-25.000.

Wakui, Natsuko: *See—*
Isogai, Nobuo; Okawa, Takashi; and Wakui, Natsuko, 4,289,911, Cl. 568-396.000.

Walberg, Maynard E., to Allis-Chalmers Corporation. Mechanism for preventing operation of a bin unloading auger when out of its unloading position. 4,289,440, Cl. 414-523.000.

Wales, Wayne F.; and Frawley, James J., to General Electric Company. Foundry mold treating compositions and methods of making same. 4,289,803, Cl. 427-134.000.

Wall, Fraser M.; Kitzen, Maurice R.; and Kreipe, T. Frederick, to Selas Corporation of America. Steam vaporization of oil. 4,289,475, Cl. 431-11.000.

Wallace, Joseph T. Proportional A-C power control. 4,290,006, Cl. 323-326.000.

Wallace, Matthew J., to United Technologies Corporation. Ceramic faced outer air seal for gas turbine engines. 4,289,446, Cl. 415-174.000.

Wallman, Irwin, to Simmonds Precision Products, Inc. Fuel quantity gauge. 4,289,028, Cl. 73-304.00C.

Wallner, Felix; and Lugscheider, Walter, to Vereinigte Oesterreichische Eisen-und Sthl-Werke Alpine Montan Akteingesellschaft. Process of cleaning an austenitic steel surface. 4,289,541, Cl. 134-7.000.

Wallrabenstein, Michael: *See—*
Zengel, Hans-Georg; Wallrabenstein, Michael; and Brodowski, Walter, 4,289,869, Cl. 528-73.000.

Walsh, Dale M., to General DataComm Industries, Inc. Synchronization of a data communication receiver with a received signal. 4,290,139, Cl. 375-14.000.

Walsh, James L.: *See—*
Konian, Richard R.; and Walsh, James L., 4,289,978, Cl. 307-270.000.

Walter, Eberhard: *See—*
Voigt, Carl; Kleinschmit, Peter; and Walter, Eberhard, 4,289,741, Cl. 423-376.000.

Walters, Paul W.: *See—*
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Wang, Harry T., to Hughes Aircraft Company. Atomic frequency standard using free induction technique. 4,290,030, Cl. 331-3.000.

Ward, Charles P. Six-cycle engine. 4,289,097, Cl. 123-292.000.

Ward, Franklin J.: *See—*
Gray, Lorin S., III; Mattor, John A.; Millard, Ben; and Ward, Franklin J., 4,289,821, Cl. 428-172.000.

Ward & Goldstone Limited: *See—*
Hampshire, Michael J., 4,290,134, Cl. 370-92.000.

Ward, William H. Solar heat collecting apparatus. 4,289,120, Cl. 126-450.000.

Warncke, Ernst; Schlobohm, Joachim; and Behnke, Jurgen, to Dragerwerk Aktiengesellschaft. Readiness receptacle for respirators. 4,289,238, Cl. 206-527.000.

Warner, Hubert H., to Caterpillar Tractor Co. Closed apparatus for coating the interior of a tank. 4,289,091, Cl. 118-642.000.

Warsinske, Arthur E., to Riley, Jack G. Portable concentrator. 4,289,270, Cl. 233-27.000.

Watanabe, Hiroshi: *See—*
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Watanabe, Kazuo: *See—*
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Water Refining Company, Inc.: *See—*
Davis, Stephen H., 4,289,617, Cl. 210-109.000.

Waters Associates, Inc.: *See—*
Rolfe, Norman F., 4,289,975, Cl. 307-246.000.

Watson, James G. O. Wave powered generator. 4,288,986, Cl. 60-501.000.

Weakly, Terence S. Swing apparatus. 4,289,310, Cl. 272-85.000.

Webb, J. Stuart, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Radio communications systems. 4,290,144, Cl. 455-63.000.

Weber, Gunter: *See—*
Bemm, Wulf W.; and Weber, Gunter, 4,289,342, Cl. 292-49.000.

Weber, Heinrich; Dungs, Horst; Wollenhaupt, Karl-Heinz; Brasseur, Yves; Birscheidt, Henri; and Beckmann, Franz, to Carl Still GmbH & Co. KG, Firma. Method of producing hot briquettes. 4,289,500, Cl. 44-15.00R.

Weber, Jurgen: *See—*
Bahrmann, Helmut; Weber, Jurgen; and Cornils, Boy, 4,289,913, Cl. 568-444.000.

Weber, Rudolf; and Andree, Hans, to Henkel Kommanditgesellschaft auf Aktien. Detergent composition having a sizing effect comprising nonionic and/or zwitterionic tensides and polysaccharide amino esters. 4,289,642, Cl. 252-99.000.

Weeks, Harold R. Refrigeration and heating improvement. 4,288,991, Cl. 62-183.000.

Weeks, Paul D.: *See—*
Brennan, Thomas M.; Brannegan, Daniel P.; Weeks, Paul D.; and Kuhla, Donald E., 4,289,704, Cl. 260-345.80R.

Weeper, Otto W. Apparatus for the continuous manufacture of hollow tubular elements. 4,289,466, Cl. 425-112.000.

Wehling, Bernhard, to Bayer Aktiengesellschaft. Benzofurane benzoxazoles. 4,289,887, Cl. 548-224.000.

Wehr Corporation: *See—*
Dorsey, Robert J., 4,289,472, Cl. 425-415.000.

Wei, Peter H. L., to American Home Products Corporation. 5-Substituted 4-hydroxy-2,3-alkylene thiazolium salts. 4,289,697, Cl. 260-245.500.

Weigele, Hans: *See—*
Mahncke, Jurgen; Weigele, Hans; and Hotz, Dieter, 4,288,881, Cl. 14-2.400.

Weinauer, Dietrich E.: *See—*
Johnston, Michael L.; Gordon, Loren J.; and Weinauer, Dietrich E., 4,289,470, Cl. 425-336.000.

Weinert, Raymond J., Jr.: *See—*
Benton, Kenneth C.; Mooney, James R.; and Weinert, Raymond J., Jr., 4,289,651, Cl. 252-429.00B.

Weinstein, David, to Maryland Cup Corporation. Ice cream cone with jacket attached and method for producing same. 4,289,791, Cl. 426-139.000.

Weinzierl, Frank. Bandsaw mill. 4,289,180, Cl. 144-312.000.

Weisser, Dieter; and Hafner, Franz, to E.A. Storz GmbH & Co., KG. Car jack. 4,289,300, Cl. 254-126.000.

Weller, Dwight D.: *See—*
Rapoport, Henry; Weller, Dwight D.; and Gless, Richard D., 4,289,882, Cl. 546-141.000.

Wendt, Hans: *See—*
Laurent, Henry; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, 4,289,763, Cl. 424-243.000.

Wern, Lars A. Touch control switch. 4,289,972, Cl. 307-116.000.

Wernert, Gregory M., to Caterpillar Tractor Co. Fire extinguishing system. 4,289,207, Cl. 169-30.000.

Weronke, Robert B.; and Bankstahl, Herbert A., to Brunswick Corporation. Stern drive gimbal arrangement. 4,289,488, Cl. 440-57.000.

Wescom Switching Inc.: *See—*
Pitroda, Satyan G.; and Mehta, Madhukumar A., 4,289,934, Cl. 179-27.00D.

West, Walter H.; and Prueter, E. D., to Dow Chemical Co., The. Method for manufacturing an improved plug valve. 4,288,896, Cl. 29-157.10R.

Western Electric Co., Incorporated: *See—*
Akselrad, Aline, 4,289,797, Cl. 427-39.000.
Eichenbaum, Bernard R.; and Topolski, Francis J., 4,289,558, Cl. 156-179.000.

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Westin, Oswald: *See*—
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Westin, Owe; Westin, Oswald; and Westin, Jan. Device for securing an expandable hub in a hole. 4,289,418, Cl. 403-369.000.

Westinghouse Electric Corp.: *See*—
Milianowicz, Stanislaw A., 4,289,942, Cl. 200-148.00A.

Westvaco Corporation: *See*—
Huang, Denis K., 4,289,808, Cl. 427-209.000.

Wetzel, Bernd; Woitun, Eberhard; Reuter, Wolfgang; Maier, Roland; Lechner, Uwe; and Goeth, Hanns, to Karl Thomae GmbH. Penicillins. 4,289,775, Cl. 424-251.000.

Whirlpool Corporation: *See*—
Kristof, Mark J., 4,289,945, Cl. 219-10.55F.

Whitacre, Robert J. Skateboard. 4,289,325, Cl. 280-87.04A.

Whitcomb, Paul H.: *See*—
Hammond, Howard A.; and Whitcomb, Paul H., 4,289,177, Cl. 144-2.00Z.

White, Ben E.: *See*—
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Whitefield, Martin: *See*—
Yarrow, Hyman; and Whitefield, Martin, 4,289,764, Cl. 424-243.000.

Whiteford, Carl. Thermal and optical multi-mode window. 4,288,953, Cl. 52-171.000.

Whitley, Donald C., to Oxoid Limited. Safety catalyst systems. 4,289,855, Cl. 435-287.000.

Whitlock, Robert R. Pattern composer for fingerboard instrument instruction. 4,289,057, Cl. 84-485.0SR.

Whittaker, Norman: *See*—
Caldwell, Albert G.; and Whittaker, Norman, 4,289,707, Cl. 260-404.500.

Whittemore, Peter G. Evacuated flat-plate solar collectors. 4,289,113, Cl. 126-418.000.

Whittington, Philip J.: *See*—
Duncan, Michael E.; Whittington, Philip J.; and Kimber, Michael P., 4,289,111, Cl. 126-391.000.

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Laurent, Henry; Wiechert, Rudolf; Wendt, Hans; and Kapp, Joachim-Friedrich, 4,289,763, Cl. 424-243.000.

Wiechowski, Joseph W.; Miller, Delmar S.; and Kostner, Richard C. Grating construction and assembly method and apparatus. 4,289,563, Cl. 156-423.000.

Wiermanski, Jerome J., to General Binding Corporation. Bookbinding system. 4,289,330, Cl. 281-21.00R.

Wikel, James H.: *See*—
Paget, Charles J.; Chamberlin, James W.; and Wikel, James H., 4,289,782, Cl. 424-273.00B.

Wilbert, Inc.: *See*—
Work, Gerald L., 4,288,952, Cl. 52-138.000.

Wilde, Lewis L. Asparagus harvester. 4,288,970, Cl. 56-327.00A.

Wilde, Ralph, to Dunlop Limited. Sealing means for pneumatic tire and wheel rim assemblies. 4,289,186, Cl. 152-379.300.

Wildman, Samuel G.; and Sheen, Shuh J., to Leaf Proteins, Inc. Process for obtaining deproteinized tobacco freed of nicotine and green pigment, for use as a smoking product. 4,289,147, Cl. 131-290.000.

Wilhelm, Donald M.: *See*—
Schnur, Andrew C.; and Wilhelm, Donald M., 4,288,998, Cl. 64-9.00R.

Wilhelm Hegenscheidt GmbH: *See*—
Berstein, Garrj, 4,289,431, Cl. 408-154.000.

Wilkerson Corporation: *See*—
Olbermann, Joseph M., 4,289,335, Cl. 285-91.000.

Wilkins, Harold B. Apparatus for punching holes in paper-like sheets and for simultaneously providing reinforcing members therefor. 4,289,565, Cl. 156-514.000.

Wilkinson, Darcy B., Jr.: *See*—
Brownhill, Richard D.; and Wilkinson, Darcy B., Jr., 4,289,513, Cl. 55-387.000.

Wilkinson, Rudolph P. Electric vehicle battery recharging station. 4,289,226, Cl. 194-84.000.

Wilks, John W., to Upjohn Company, The. Combination of 5-oxa-17-phenyl-PGF$_{1\alpha}$'s estrogenic compounds for menses induction. 4,289,761, Cl. 424-240.000.

Wilks, John W., to Upjohn Company, The. Method and compositions involving prostaglandins. 4,289,785, Cl. 424-279.000.

Willhalm, Bruno: *See*—
Schulte-Elte, Karl-Heinrich; Willhalm, Bruno; and Gautschi, Fritz, 4,289,659, Cl. 252-522.00R.

Williams, Robert H., to Meadowbrook Resort, Inc. Solar heating system for a greenhouse or other building. 4,289,116, Cl. 126-431.000.

Willis, Brian J.; and Yurecko, John M., Jr., to Fritzsche Dodge & Olcott Inc. 2-[-(2'2'3'-Trimethyl-3'-cyclopenten-1'-yl)-ethyliden]-and ethyl]-cyclopentanols. 4,289,658, Cl. 252-522.00R.

Wills, Walter L.; Vaughn, Herchel A.; and Miller, Larry L., to Varo Semiconductor, Inc. Method of constructing and processing a diode capacitor assembly. 4,288,912, Cl. 29-577.00C.

Willy Rusch GmbH & Co. KG.: *See*—
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Wilson, Gordon A.: *See*—
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Wilson Industries, Inc.: *See*—
Nelson, Paul M., 4,289,021, Cl. 73-862.250.

Wilson, John C.; and Yacobucci, Paul D., to Eastman Kodak Company. Polymers acryloyloxyarylenesulfonamides. 4,289,865, Cl. 526-288.000.

Wilson, John M., to Halliburton Company. Method for removing cobalt-containing deposits from surfaces. 4,289,576, Cl. 156-667.000.

Wimmer, Walter: *See*—
Brunner, Heinrich; Drebinger, Peter; Hoehne, Peter; Hoisl, Johann; Kochanowski, Guenter; and Wimmer, Walter, 4,290,136, Cl. 371-25.000.

Windheuser, John J., to Merck & Co., Inc. Effervescent enteric-coated formulation of soluble form of erythromycin and therapeutic use thereof. 4,289,751, Cl. 424-35.000.

Windmoller & Holscher: *See*—
Achelpohl, Fritz, 4,289,567, Cl. 156-517.000.

Winter, William E.: *See*—
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Wisconsin Alumni Research Foundation: *See*—
Seireg, Ali A.; and Baz, Amr M. S., 4,289,126, Cl. 128-204.240.

Wissel, F. A.; and Kiliman, D. A., to Cincinnati Electronics Corporation. Transmission method and apparatus wherein binary data bits are converted into barker words and vice versa. 4,290,143, Cl. 455-38.000.

Wissner, Allan; and Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Hydroxymethyl-prosten-1-ol derivatives. 4,289,910, Cl. 568-367.000.

Withers, James G., Jr., to UOP Inc. Method of producing a nucleate boiling surface on a heat transfer member. 4,288,897, Cl. 29-157.400.

Woehrle, Patrick; Habock, Adolf; and Muller, Paul F., to Siemens Aktiengesellschaft. Control unit for a converter. 4,290,108, Cl. 364-480.000.

Woitun, Eberhard: *See*—
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Wojnarowski, Robert J.: *See*—
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Wollenhaupt, Karl-Heinz: *See*—
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Wood, Frank, Jr.: *See*—
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Woolston, A. Brent; and Evans, Donald J., to Molins Machine Company, Inc. Web gap control for corrugator. 4,289,052, Cl. 83-26.000.

Work, Gerald L., to Wilbert, Inc. Burial vaults. 4,288,952, Cl. 52-138.000.

Worthington, Paul A.; de Fraine, Paul; Rathmell, William G.; and Gatehouse, Diana M., to Imperial Chemical Industries Limited. Heterocyclic compounds, processes for their preparation, pesticidal compositions containing them and methods of combating pests. 4,289,526, Cl. 71-92.000.

Worthington, Ralph E.; Luke, Donald A.; and Reese, Stanton L., to Uranium Recovery Corporation. Process for removing solid organic materials and other impurities from wet-process phosphoric acid. 4,289,609, Cl. 209-11.000.

Wright, Charles P.: *See*—
Bhat, Waman V.; and Wright, Charles P., 4,288,984, Cl. 60-262.000.

Wright, Elwood H. Turbine-type engine. 4,288,981, Cl. 60-39.380.

Wright, William B., Jr.; and Tomcufcik, Andrew S., to American Cyanamid Company. Derivatives of p-formylbenzamide amidinohydrazone and use thereof. 4,289,769, Cl. 424-248.560.

Wrulich, Herwig: *See*—
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Wyatt, William G., to Vapor Energy, Inc. Vapor generator. 4,288,978, Cl. 60-39.050.

Xerox Corporation: *See*—
Bates, Roger D.; and Knight, Gordon R., 4,290,122, Cl. 365-234.000.
Gundlach, Robert W., 4,289,837, Cl. 430-39.000.
Kramer, Charles J., 4,289,371, Cl. 350-3.710.
McChesney, John L.; and Tacklind, Thomas A., 4,289,092, Cl. 118-660.000.
McFarland, Keith E., 4,290,076, Cl. 346-154.000.
Ronen, Ram S., 4,290,077, Cl. 357-41.000.
Ronen, Ram S., 4,290,078, Cl. 357-41.000.
Sun, Kai C. K., 4,290,000, Cl. 318-566.000.

Xomox Corporation: *See*—
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Yabuta, Keiichiro, to Nissan Motor Company, Limited. Seat belt system. 4,289,329, Cl. 280-804.000.

Yacobucci, Paul D.: *See*—
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Yajima, Seishi; Shishido, Toetsu; Okamura, Kiyohito; Kayano, Hideo; Hayashi, Josaburo; and Kobayashi, Hiroshi, to Foundation: The Research Institute for Special Inorganic Materials, The. Process for producing a thermal-resistant ceramic fired body. 4,289,720, Cl. 264-63.000.

Yamada, Takayoshi: *See*—
Namba, Takamasa; Yanagawa, Hidekata; Fujimoto, Nobuo; Mori, Takehiko; and Yamada, Takayoshi, 4,289,263, Cl. 226-196.000.

Yamagata, Masakazu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photographic lens with rear stop diaphragm. 4,289,385, Cl. 350-468.000.

Yamaguchi, Noboru: *See*—
Sugie, Mamoru; Yamaguchi, Noboru; Mayama, Koichi; Kita, Yuzo; Yoshizawa, Shigeru; Saito, Nobuo; and Asano, Atsushi, 4,290,117, Cl. 365-15.000.

Yamakawa, Katsuyoshi: *See*—
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Yamamoto Electric Industrial Co., Ltd.: *See*—
Sato, Yoshitoshi, 4,290,042, Cl. 338-113.000.

Yamamoto, Masaki; and Azuma, Ichiro, to Toyo Rubber Industry Co., Ltd., The. Process for preparing non-yellowing integral-skinned polyurethane foam using a polyol having a functionality of 4 to 8. 4,289,856, Cl. 521-51.000.

Yamamoto, Ryuji; and Ohsawa, Kiyotaka, to Soundesign Corporation. Apparatus for and method of noise-free detection of inter-feature pauses to control selective replay in tape recording/reproduction systems. 4,290,090, Cl. 360-72.100.

Yamamoto, Shigeyuki: *See*—
Mabuchi, Katsuya; and Yamamoto, Shigeyuki, 4,289,577, Cl. 159-5.000.

Yamanaka, Junichi; Nakamura, Noboru; Fujiki, Hirokazu; and Miyaji, Yoshimori, to Tokyo Shibaura Denki Kabushiki Kaisha. Scanning-area rotation device for an image pickup tube. 4,290,038, Cl. 335-214.000.

Yamanashi, Koji: *See*—
Nakayama, Yoshiki; Yazawa, Chihiro; and Yamanashi, Koji, 4,289,916, Cl. 570-209.000.

Yamazaki, Masafumi: *See*—
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Yamazaki, Yasuo: *See*—
Kobori, Toshio; Yamazaki, Yasuo; and Uchida, Isamu, 4,289,392, Cl. 354-225.000.

Yanagawa, Hidekata: *See*—
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Yang, Tayhugh L. Key holder. 4,289,003, Cl. 70-456.00B.

Yankov, Anatoly F.: *See*—
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Yano, Robert A., to Comet, Inc. Fuel and apparatus for drying grain. 4,289,481, Cl. 432-96.000.

Yaron, Anselm: *See*—
Lustig, Leopold P.; and Yaron, Anselm, 4,289,849, Cl. 433-123.000.

Yarrow, Hyman; and Whitefield, Martin, to Drythanol Ltd. Steroid compositions. 4,289,764, Cl. 424-243.000.

Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., to Olin Corporation. Electromagnetic casting apparatus. 4,289,946, Cl. 164-503.000.

Yasui Sangyo Co., Ltd.: *See*—
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Kameda, Tamotsu, 4,289,299, Cl. 254-8.00B.

Yasukawa, Masao: *See*—
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Yearout, James D. Production of nitrogen by air separation. 4,289,515, Cl. 62-13.000.

Yen, Kuo-hsiung: *See*—
Kagiwada, Reynold S.; Yen, Kuo-hsiung; and Lau, Kei-fung, 4,290,033, Cl. 333-141.000.

Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Voltage-to-current converter circuit. 4,290,024, Cl. 330-85.000.

Yolken, Robert: *See*—
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Yoneda, Kenji: *See*—
Katsumata, Masaaki; Onoda, Michio; Takagi, Yasuo; and Yoneda, Kenji, 4,289,102, Cl. 123-425.000.

Yong, Raymond N.; and Sethi, Amar J., to Suncor Inc. Hydrolyzed starch-containing compositions. 4,289,540, Cl. 127-33.000.

Yoshida Kogyo K. K.: *See*—
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Yoshida, Takao; and Vock, Manfred H., to International Flavors & Fragrances Inc. Cyclic acetals of 2-methyl-2-pentenal and food flavor uses thereof. 4,289,700, Cl. 260-340.90R.

Yoshida, Yoshiaki; Suzuki, Osamu; Onoue, Keiji; and Seiki, Kazuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for starting a spinning machine. 4,288,975, Cl. 57-263.000.

Yoshikumi, Chikao: *See*—
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Yoshiwara, Seishiro; and Higashiyama, Hirokichi, to Nippon Steel Corporation. Continuous pipe rolling process. 4,289,011, Cl. 72-208.000.

Yoshizawa, Shigeru: *See*—
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Young, Bruce O.; and Seegmiller, Wan, to Energy Absorption Systems, Inc. Inertial barrier system. 4,289,419, Cl. 404-6.000.

Young, Richard K., to Phillips Petroleum Company. Heat exchanger. 4,289,198, Cl. 165-159.000.

Yu, Kin C.: *See*—
Holtey, Thomas O.; Miller, Robert C.; and Yu, Kin C., 4,290,104, Cl. 364-200.000.

Yun, Ik Y.: *See*—
Yarwood, John C.; Yun, Ik Y.; Tyler, Derek E.; and Kindlmann, Peter J., 4,289,946, Cl. 164-503.000.

Yurecko, John M., Jr.: *See*—
Willis, Brian J.; and Yurecko, John M., Jr., 4,289,658, Cl. 252-522.00R.

Zachary, Richard E.: *See*—
Christensen, Marvin M.; Zachary, Richard E.; and Dupont, Andra P., 4,289,807, Cl. 427-195.000.

Zadiraka, Allan J., to Babcock & Wilcox Company, The. Control system for a solar steam generator. 4,289,114, Cl. 126-421.000.

Zaidel, Simon A.: *See*—
Parks, Earl L.; and Zaidel, Simon A., 4,289,846, Cl. 430-314.000.

Zakiewicz, Bohdan M., to Higgins, Edwin G., Jr. Borehole mining of solid mineral resources. 4,289,354, Cl. 299-4.000.

Zalewski, Edwin: *See*—
Disselbeck, Dieter; Neumann, Gerhard; Ott, Karl-Heinz; Strobel, Gunther; and Zalewski, Edwin, 4,289,627, Cl. 210-702.000.

Zalm, Pieter: *See*—
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Zavadil, Jaroslav: *See*—
Brand, Werner; Zavadil, Jaroslav; and Heuer, Wolfgang, 4,289,247, Cl. 213-20.000.

Zecher, Wilfried: *See*—
Lewalter, Jurgen; Merten, Rudolf; Zecher, Wilfried; and Dunwald, Willi, 4,289,868, Cl. 528-73.000.

Zeigler, John F., III: *See*—
McFadyen, Robert J.; and Zeigler, John F., III, 4,290,126, Cl. 367-93.000.

Zeiler, Hans-Joachim: *See*—
Sasse, Klaus; Haller, Ingo; Plempel, Manfred; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,289,771, Cl. 424-249.000.

Zemanek, Josef, to Siemens Aktiengesellschaft. Circuit arrangement for receiving digital intelligence signals in a digital switching center for PCM-time-division multiplex communication networks. 4,290,135, Cl. 370-110.000.

Zengel, Hans-Georg; Wallrabenstein, Michael; and Brodowski, Walter, to Akzo NV. Mixture hardening under the influence of air moisture and a process for production of polyisocyanate-poly-addition products or of cross-linked polyepoxides. 4,289,869, Cl. 528-73.000.

Zenith Radio Corporation: *See*—
Beaumont, Gregory J.; and Matthews, Lloyd E., 4,289,994, Cl. 315-371.000.
Shah, Ricky H., 4,289,800, Cl. 427-68.000.

Zhestkov, Vitaly I.: *See*—
Tikhonov, Valentin N.; Zhestkov, Vitaly I.; Shlykov, Gennady N.; Diachkov, Vasily M.; Mukhin, Viktor M.; and Zhigalov, Gennady V., 4,288,889, Cl. 19-236.000.

Zhigalov, Gennady V.: *See*—
Tikhonov, Valentin N.; Zhestkov, Vitaly I.; Shlykov, Gennady N.; Diachkov, Vasily M.; Mukhin, Viktor M.; and Zhigalov, Gennady V., 4,288,889, Cl. 19-236.000.

Zhuber-Okrog, Gerhard: *See*—
Mueller, Hans P.; Alder, Hanspeter; and Zhuber-Okrog, Gerhard, 4,289,735, Cl. 423-136.000.

Zichy, Theodore B. R. Voice amplification apparatus. 4,289,938, Cl. 179-156.00A.

Zickel, Robert E. Surgical appliance for the fixation of fractured bones. 4,289,124, Cl. 128-92.00D.

Ziehn, Klaus-Dieter. Process for improving the filling capacity of tobacco. 4,289,148, Cl. 131-291.000.

Zievers, James F.: *See*—
Schmidt, Henry, Jr.; Cederholm, Allen E.; and Zievers, James F., 4,289,630, Cl. 210-785.000.

Zimmerman, Lee T.: *See*—
Bare, Gary T.; and Zimmerman, Lee T., 4,290,138, Cl. 371-29.000.

Zimmermann, Helmuth: *See*—
Reim, Werner; Gernlein, Hermann; and Zimmermann, Helmuth, 4,289,228, Cl. 198-339.000.

Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann J., to Kernforschungsanlage Julich GmbH. Physiological preparation containing loaded cells of expanded volume in suspension, for preferential accumulation in spleen and liver. 4,289,756, Cl. 424-101.000.

Zipser, Randall E.; and Stringfellow, H. Berton, to Sperry Corporation. Delivery tray release mechanism for a bale wagon. 4,289,436, Cl. 414-76.000.

Zirin, Louis I., to General Electric Company. Bearing damper system. 4,289,360, Cl. 308-178.000.

Zitz, Alfred: *See*—
Hintermann, Rudolf; Zitz, Alfred; Schetina, Otto; and Wrulich, Herwig, 4,289,357, Cl. 299-81.000.

Zollner, Manfred; Hoffmann, Christian; and Zwicker, Eberhard, to Siemens Aktiengesellschaft. Method for generating acoustical voice signals for persons extremely hard of hearing and a device for implementing this method. 4,289,935, Cl. 179-107.0FD.

Zoor, Reinhold, to Heinrich Wunder KG. Roof carrier for motor vehicles. 4,289,260, Cl. 224-315.000.

Zuckerman, Leonard: *See*—
Spencer, David R.; and Zuckerman, Leonard, 4,290,086, Cl. 358-293.000.

Zwicker, Eberhard: *See*—
Zollner, Manfred; Hoffmann, Christian; and Zwicker, Eberhard, 4,289,935, Cl. 179-107.0FD.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF SEPTEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Azmoon, Majid: *See*—
Shelley, David J.; Warp, Rick A.; and Azmoon, Majid, Re. 30,743, Cl. 346-76.0PH.

Bunker Ramo Corporation: *See*—
Cole, Robert H.; Feuer, Robert; Nissim, Samuel; and Podraza, George V., Re. 30,744, Cl. 365-227.000.

Cole, Robert H.; Feuer, Robert; Nissim, Samuel; and Podraza, George V., to Bunker Ramo Corporation. Digital memory apparatus. Re. 30,744, Cl. 365-227.000.

Feuer, Robert: *See*—
Cole, Robert H.; Feuer, Robert; Nissim, Samuel; and Podraza, George V., Re. 30,744, Cl. 365-227.000.

Hewlett-Packard Company: *See*—
Shelley, David J.; Warp, Rick A.; and Azmoon, Majid, Re. 30,743, Cl. 346-76.0PH.

Nakagaki, Norio; and Sawada, Shigeru, to Shinshu Seiki Kabushiki Kaisha. Miniaturized printer control assembly. Re. 30,741, Cl. 101-99.000.

Nissim, Samuel: *See*—
Cole, Robert H.; Feuer, Robert; Nissim, Samuel; and Podraza, George V., Re. 30,744, Cl. 365-227.000.

Podraza, George V.: *See*—
Cole, Robert H.; Feuer, Robert; Nissim, Samuel; and Podraza, George V., Re. 30,744, Cl. 365-227.000.

Sawada, Shigeru: *See*—
Nakagaki, Norio; and Sawada, Shigeru, Re. 30,741, Cl. 101-99.000.

Shelley, David J.; Warp, Rick A.; and Azmoon, Majid, to Hewlett-Packard Company. Thermal printer-plotter system for multi-directional printing and plotting. Re. 30,743, Cl. 346-76.0PH.

Shinshu Seiki Kabushiki Kaisha: *See*—
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Warp, Rick A.: *See*—
Shelley, David J.; Warp, Rick A.; and Azmoon, Majid, Re. 30,743, Cl. 346-76.0PH.

Weier, Roman J., to Wyard Industries, Inc. Container depalletizing apparatus. Re. 30,742, Cl. 414-119.000.

Wyard Industries, Inc.: *See*—
Weier, Roman J., Re. 30,742, Cl. 414-119.000.

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Abbott Laboratories: *See*—
Goldhardt, Donald J.; and Willis, Darcy M., 260,814, Cl. D24-24.000.

Abbott, Warren D., Jr.: *See*—
Headen, James J.; Abbott, Warren D., Jr.; and Hampton, Clifton G., 260,808, Cl. D23-35.000.

Acoustics Development Corporation: *See*—
Hannula, Leslie A.; and Browning, Fred L., 260,702, Cl. D6-20.000.

Adams, John F. Animal trap. 260,801, 9-15-81, Cl. D22-18.000.

Aktiebolaget Volvo: *See*—
Jonasson, Kjell O., 260,701, Cl. D6-9.000.

Allibert Exploitation Societe Anonyme: *See*—
Deconinck, Didier, 260,707, Cl. D6-99.000.

Anderson, Lenart: *See*—
Zissimopoulos, Nicholas; and Anderson, Lenart, 260,816, Cl. D24-31.000.

Arenhold, Knut. Mud flap. 260,759, 9-15-81, Cl. D12-185.000.

Baffo, Charles M., to Mobil Oil Corporation. Combined service station building and canopy. 260,819, 9-15-81, Cl. D25-33.000.

Barr, Josef J. Earring pendant. 260,744, 9-15-81, Cl. D11-43.000.

Bateman, Robert F., to Dart Industries Inc. Scoop or the like. 260,722, 9-15-81, Cl. D7-104.000.

Baxter Travenol Laboratories, Inc.: *See*—
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Belyaev, Sergei M.: *See*—
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Bennett, Eli J. Garden implement. 260,724, 9-15-81, Cl. D8-12.000.

Bergholtz, Gosta O.: *See*—
Klatzkow, Leif; and Bergholtz, Gosta O., 260,745, Cl. D11-48.000.

Bianchi, John E. Gun grip. 260,799, 9-15-81, Cl. D22-1.000.

Bianchi, John E.; and Nichols, Richard D. E. Cross draw holster. 260,800, 9-15-81, Cl. D22-13.000.

Boldt, Melvin H., to Rowe International, Inc. Phonograph. 260,765, 9-15-81, Cl. D14-15.000.

Borugian, Dennis A., to Eaton Corporation. Universal air chamber mounting bracket. 260,758, 9-15-81, Cl. D12-180.000.

Breger, Carl A., to Sandvik Aktiebolag. Plane. 260,728, 9-15-81, Cl. D8-101.000.

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Brookfield, Helen K. Baby carrying garment. 260,695, 9-15-81, Cl. D2-190.000.

Brown, Dwight C. Pair of combined rigid temples and flexible integrated ear clips for hearing aid spectacles. 260,774, 9-15-81, Cl. D16-127.000.

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Canon Kabushiki Kaisha: *See*—
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Yoshioka, Eiichi; and Okuyama, Tsutomu, 260,777, Cl. D18-7.000.

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Castagna, John F.; and Emmerling, Ronald A., to Sparkomatic Corporation. Control unit for a combined automobile cassette player, radio and digital clock. 260,763, 9-15-81, Cl. D14-10.000.

Castagna, John F.; and Emmerling, Ronald A., to Sparkomatic Corporation. Control unit for a combined automobile cassette player and radio. 260,764, 9-15-81, Cl. D14-10.000.

Chaklos, Stanley C. Illumination device for attachment to toy flying saucer. 260,786, 9-15-81, Cl. D21-82.000.

Christine, William C. Dispensing bag for fluidic uses. 260,817, 9-15-81, Cl. D24-58.000.

Cleveland, Marvin G. Automotive hose fitting. 260,810, 9-15-81, Cl. D23-44.000.

Cohen, Steve J.; and Hillebrand, Cory W. Support stand for a computer. 260,715, 9-15-81, Cl. D6-186.000.

Cohen, Steve J.; and Hillebrand, Cory W. Support stand for a computer. 260,716, 9-15-81, Cl. D6-186.000.

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DeMars, Donald A., to Lefkowitz, LeRoy M., a part interest. Wall or partition hung graphics holder. 260,782, 9-15-81, Cl. D20-42.000.

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Edson, Sydney: *See—*
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Edwards, Richard L.; and Kesten, Martin, to Preston Engravers, Inc. Fan folding apparatus. 260,778, 9-15-81, Cl. D18-22.000.
Edwards, William A. Wine chiller. 260,720, 9-15-81, Cl. D7-70.000.
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Emmerling, Ronald A.: *See—*
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Fitzgerald, Susan A.; and Watson, Russell B., Jr. Back pack. 260,697, 9-15-81, Cl. D3-32.000.
Fitzgerald, Susan A.; and Watson, Russell B., Jr. Back pack. 260,698, 9-15-81, Cl. D3-32.000.
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Fujita, Yoshinari, to Okura Electric Industry Co., Ltd. Cable clamp. 260,730, 9-15-81, Cl. D8-356.000.
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Gaudio, John P. Guitar. 260,775, 9-15-81, Cl. D17-18.000.
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Hall, Lester B., to Hall, Gary Lester. Ultrasonic pest repelling device. 260,802, 9-15-81, Cl. D22-18.000.
Hall, Lester B., to Hall, Gary Lester. Ultrasonic pest repelling device. 260,803, 9-15-81, Cl. D22-18.000.
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Headen, James J.; Abbott, Warren D., Jr.; and Hampton, Clifton G., to Headen, James J.; and Abbott, Warren D., Jr. Liquid dispenser for showers or the like. 260,808, 9-15-81, Cl. D23-35.000.
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425 4,289,102
440 4,289,103
471 4,289,104
500 4,289,105
527 4,289,106
571 4,289,107
4,289,108

CLASS 124

67 4,289,109

CLASS 125

11 CD 4,289,110

CLASS 126

391 4,289,111
415 4,289,112
418 4,289,113
421 4,289,114
430 4,289,115
431 4,289,116
436 4,289,117
440 4,289,118
4,289,119
450 4,289,120

CLASS 127

33 4,289,540

CLASS 128

1 C 4,289,121
80 E 4,289,122
84 R 4,289,123
92 D 4,289,124
156 4,289,125
204.24 4,289,126
207.14 4,289,127
207.15 4,289,128
214 G 4,289,129
287 4,289,130
303 R 4,289,131
303.14 4,289,132
334 C 4,289,133
419 PG 4,289,134
419 R 4,289,135
421 4,289,136
482 4,289,137
642 4,289,138
660 4,289,139
4,289,140
713 4,289,141
716 4,289,142
746 4,289,143
785 4,289,144

CLASS 131

175 4,289,149
276 4,289,145
4,289,146
290 4,289,147
291 4,289,148

CLASS 132

7 4,289,150
37 R 4,289,151
74.5 4,289,152
85 4,289,153

CLASS 134

7 4,289,541
11 4,289,542
25.2 4,289,543
56 D 4,289,154
167 R 4,289,155

CLASS 135

66 4,289,156

CLASS 136

246 4,289,920

CLASS 137

72 4,289,157
205 4,289,158
454.4 4,289,159
491 4,289,160
499 4,289,161
572 4,289,162
587 4,289,163
614.03 4,289,164
625.32 4,289,165
846 4,289,166
869 4,289,167

CLASS 138

109 4,289,168
117 4,289,169
4,289,170
145 4,289,171
149 4,289,172

CLASS 139

383 A 4,289,173

CLASS 140

93.4 4,289,174
4,289,175

CLASS 141

35 4,289,176

CLASS 144

2 Z 4,289,177
188 4,289,178
211 4,289,179
312 4,289,180

CLASS 148

4 4,289,544
6.15 R 4,289,546
4,289,547
6.3 4,289,545
12 B 4,289,548
101 4,289,549
175 4,289,550

CLASS 149

19.4 4,289,551

CLASS 152

209 B 4,289,183
209 R 4,289,182
354 R 4,289,184
361 DM 4,289,185
379.3 4,289,186
418 4,289,187

CLASS 156

73.4 4,289,552
86 4,289,553
92 4,289,554
149 4,289,555
157 4,289,556
171 4,289,557
179 4,289,558
238 4,289,559
244.18 4,289,560
265 4,289,561
364 4,289,562
423 4,289,563
425 4,289,564
514 4,289,565
515 4,289,566
517 4,289,567
518 4,289,568
580.2 4,289,569
617 H 4,289,571
617 SP 4,289,572
626 4,289,188
643 4,289,573
4,289,574
656 4,289,575
667 4,289,576

CLASS 159

5 4,289,577
47 WL 4,289,578

CLASS 160

160 4,289,189
332 4,289,190

CLASS 162

58 4,289,579
109 4,289,580
161 4,289,581

CLASS 164

45 4,289,191
109 4,289,193
122.1 4,289,570

170 4,289,194
470 4,289,192
503 4,289,946

CLASS 165

12 4,289,195
83 4,289,196
115 4,289,197
159 4,289,198

CLASS 166

65 R 4,289,199
120 4,289,200
183 4,289,201
212 4,289,202
274 4,289,203
303 4,289,204
315 4,289,205
348 4,289,206

CLASS 169

30 4,289,207

CLASS 172

7 4,289,208

CLASS 173

107 4,289,209

CLASS 174

48 4,289,921
52 FP 4,289,922
65 G 4,289,923
152 G 4,289,924

CLASS 175

319 4,289,210
410 4,289,211

CLASS 176

38 4,289,582

CLASS 178

18 4,289,925
19 4,289,926
4,289,927

CLASS 179

1 D 4,289,928
1 E 4,289,929
2 TV 4,289,930
5.5 4,289,931
18 BC 4,289,932
18 FA 4,289,933
27 D 4,289,934
107 FD 4,289,935
111 R 4,289,936
119 R 4,289,937
156 A 4,289,938
170 D 4,289,939

CLASS 180

19 R 4,289,212
233 4,289,213
234 4,289,214

CLASS 182

92 4,289,215

CLASS 188

72.2 4,289,216
73.38 4,289,217
134 4,289,218

CLASS 192

0.033 4,289,222
2 4,289,219
3.3 4,289,220
3.57 4,289,221
48.91 4,289,223
50 4,289,224

CLASS 194

9 T 4,289,225
84 4,289,226

CLASS 196

115 4,289,583

CLASS 198

334 4,289,227
339 4,289,228
633 4,289,229
811 4,289,230
834 4,289,231

CLASS 200

5 A 4,289,940
146 R 4,289,941
148 A 4,289,942
159 B 4,289,943

CLASS 201

39 4,289,584

CLASS 202

227 4,289,585

CLASS 203

1 4,289,586
2 4,289,588
6 4,289,587
49 4,289,589

CLASS 204

32 S 4,289,602
98 4,289,590
129 4,289,591
157.1 R 4,289,592
158 R 4,289,593
4,289,594
159.11 4,289,595
180 R 4,289,596
4,289,597
192 E 4,289,598
275 4,289,599
296 4,289,600
4,289,601

CLASS 206

37 4,289,232
221 4,289,233
259 4,289,234
387 4,289,235
432 4,289,236
443 4,289,237
527 4,289,238
624 4,289,240
625 4,289,239

CLASS 208

8 LE 4,289,603
106 4,289,604
113 4,289,605
120 4,289,606
4,289,607
121 4,289,608

CLASS 209

11 4,289,609
18 4,289,610
44 4,289,241
144 4,289,611
166 4,289,612
167 4,289,613
308 4,289,614

CLASS 210

91 4,289,615
101 4,289,616
109 4,289,617
142 4,289,618
159 4,289,619
198.2 4,289,620
222 4,289,621
225 4,289,622
247 4,289,623
404 4,289,624
603 4,289,625
616 4,289,626
702 4,289,627
703 4,289,628
737 4,289,629
785 4,289,630

CLASS 211

4 4,289,242
35 4,289,243
117 4,289,244
133 4,289,245
205 4,289,246

CLASS 213

20 4,289,247

CLASS 215

330 4,289,248

CLASS 219

10.41 4,289,944
10.55 F 4,289,945
69 D 4,289,947
110 4,289,948
4,289,951
121 L 4,289,952
121 PR 4,289,949
124.34 4,289,950
230 4,289,953
307 4,289,954
532 4,289,955

CLASS 220

22 4,289,249
269 4,289,250
4,289,251
308 4,289,252

CLASS 221

1 4,289,253
295 4,289,254

CLASS 222

52 4,289,256
81 4,289,255
146 HE 4,289,257
308 4,289,258
590 4,289,259

CLASS 224

315 4,289,260

CLASS 225

2 4,289,261
106 4,289,262

CLASS 226

196 4,289,263

CLASS 229

5.5 4,289,265
28 BC 4,289,266
39 R 4,289,267
41 B 4,289,268

CLASS 232

16 4,289,269

CLASS 233

27 4,289,270

CLASS 235

92 T 4,289,956
462 4,289,957
489 4,289,958

CLASS 236

1 G 4,289,271
91 D 4,289,272

CLASS 238

8 4,289,273
249 4,289,274

CLASS 239

101 4,289,275
305 4,289,276
452 4,289,277
706 4,289,278

CLASS 241

102 4,289,279
207 4,289,280

CLASS 242

7.05 B 4,289,281
71.8 4,289,282
84.2 R 4,289,283
186 4,289,284
199 4,289,285

CLASS 244

1 R 4,289,286
45 R 4,289,287

CLASS 248

56 4,289,288
235 4,289,289
251 4,289,290
293 4,289,291
333 4,289,292

CLASS 249

74 4,289,293

CLASS 250

201 4,289,959
222 R 4,289,960
223 B 4,289,961
231 P 4,289,963
231 SE 4,289,962
308 4,289,964
363 S 4,289,965
378 4,289,966
385 4,289,967
445 T 4,289,968
4,289,969

CLASS 251

62 4,289,294
149.2 4,289,295
306 4,289,296
4,289,297

CLASS 252

8.5 B 4,289,631
8.5 LC 4,289,632
8.55 B 4,289,633
32.5 4,289,634
32.7 E 4,289,635
49.3 4,289,636
49.5 4,289,637
85 4,289,638
87 4,289,639
95 4,289,640
96 4,289,641
99 4,289,642
103 4,289,643
127 4,289,644
178 4,289,645
305 4,289,646
373 4,289,647
408 4,289,648
4,289,649
425.3 4,289,650
429 B 4,289,651
437 4,289,652
453 4,289,653
456 4,289,654
466 B 4,289,655
470 4,289,656
477 R 4,289,657
522 R 4,289,658
4,289,659
4,289,660
4,289,661
607 4,289,662

CLASS 254

8 B 4,289,298
4,289,299
126 4,289,300

CLASS 256

13.1 4,289,301
19 4,289,302
69 4,289,303

CLASS 260

17.5 4,289,663
19 R 4,289,664
21 4,289,665
23 AR 4,289,668
23 H 4,289,666
23 XA 4,289,667
27 EV 4,289,669
28.5 AV 4,289,670
4,289,671
29.2 TN 4,289,672
29.4 R 4,289,673
29.6 CM 4,289,675
29.6 H 4,289,676
29.6 NR 4,289,674
33.6 PQ 4,289,679
33.6 SB 4,289,677
33.6 UA 4,289,678
37 N 4,289,682
37 R 4,289,680
37 SB 4,289,681
38 4,289,683
40 R 4,289,684
45.7 S 4,289,685
45.8 NT 4,289,686
45.85 E 4,289,687
112 B 4,289,691
112 R 4,289,688
4,289,689
4,289,690
112.5 R 4,289,692
146 R 4,289,693
208 4,289,694
239 A 4,289,695
245.2 T 4,289,696
245.5 4,289,697
314.5 4,289,698
326.5 FM 4,289,699
340.9 R 4,289,700
343.6 4,289,701
343.7 4,289,702
345.1 4,289,705
345.8 R 4,289,703
4,289,704
369 4,289,706
404.5 4,289,707
413 4,289,708
456 P 4,289,711
967 4,289,712

CLASS 261

27 4,289,713
34 R 4,289,714
44 C 4,289,715

CLASS 264

45.9 4,289,716
46.5 4,289,717
50 4,289,718
61 4,289,719
63 4,289,720
85 4,289,721
102 4,289,722
187 4,289,723
225 4,289,724
287 4,289,725
318 4,289,726
514 4,289,727

CLASS 267

112 4,289,304

CLASS 269

43 4,289,305

CLASS 272

33 R 4,289,306
52.5 4,289,307
70 4,289,308
73 4,289,309
85 4,289,310

CLASS 273

63 A 4,289,312
167 F 4,289,311
256 4,289,313
260 4,289,314
298 4,289,315

CLASS 277

1 4,289,317
12 4,289,318
27 4,289,264
59 4,289,319
67 4,289,320
152 4,289,321
188 A 4,289,322

CLASS 280

11.21 4,289,323
38 4,289,324
87.04 A 4,289,325
646 4,289,326
737 4,289,327
803 4,289,328
804 4,289,329

CLASS 281

21 R 4,289,330
47 4,289,331

CLASS 282

27.5 4,289,332

CLASS 283

35 4,289,333

CLASS 285

55 4,289,334
91 4,289,335
136 4,289,336
158 4,289,337
229 4,289,338
305 4,289,339
382.4 4,289,340

CLASS 289

16.5 4,289,341

CLASS 290

44 4,289,970
52 4,289,971

CLASS 292

49 4,289,342
117 4,289,343

CLASS 294

2 4,289,344

CLASS 296

37.16 4,289,345
105 4,289,346
107 4,289,347
157 4,289,348
213 4,289,349

CLASS 297

172 4,289,350
307 4,289,351
473 4,289,352

CLASS 298

17.5 4,289,353

CLASS 299

4 4,289,354
9 4,289,355
33 4,289,356
81 4,289,357

CLASS 303

6 C 4,289,359
22 R 4,289,358

CLASS 307

116 4,289,972
246 4,289,975
247 R 4,289,976
270 4,289,977
4,289,978
272 A 4,289,979
308 4,289,980
350 4,289,981
448 4,289,973
463 4,289,982
527 4,289,974

CLASS 308

178 4,289,360

CLASS 310

26 4,289,987
49 R 4,289,983
54 4,289,984
61 4,289,985
4,289,986
68 E 4,289,988
261 4,289,989

CLASS 312

100 4,289,361
138 R 4,289,362
257 R 4,289,363

CLASS 313

143 4,289,990
489 4,289,991

CLASS 315

39.77 4,289,992
311 4,289,993
371 4,289,994

CLASS 318

9 4,289,995
38 4,289,996
113 4,289,997
254 4,289,998
341 4,289,999
566 4,290,000
811 4,290,001

CLASS 320

20 4,290,002

CLASS 323

241 4,290,003
270 4,290,007
311 4,290,004
313 4,290,005
326 4,290,006

CLASS 324

57 R 4,290,008
4,290,009
57 SS 4,290,010
71 CP 4,290,011
71 EB 4,290,012
73 PC 4,290,013
77 A 4,290,014
158 R 4,290,015
216 4,290,016
237 4,290,017
255 4,290,018
311 4,290,019
334 4,290,020
429 4,290,021

CLASS 328

55 4,290,022

CLASS 330

9 4,290,023
85 4,290,024
254 4,290,025
255 4,290,026
293 4,290,027

CLASS 331

1 A 4,290,028
4,290,029
3 4,290,030
94.5 D 4,290,032
94.5 G 4,290,031

CLASS 333

141 4,290,033
173 4,290,034
186 4,290,035
215 4,290,036

CLASS 335

202 4,290,037
214 4,290,038
262 4,290,039
274 4,290,040

CLASS 338

21 4,290,041
113 4,290,042

CLASS 339

17 CF 4,289,364
21 R 4,289,365
49 B 4,289,366
64 R 4,289,367
89 M 4,289,368
118 R 4,289,369
125 R 4,289,370

CLASS 340

29 4,290,043
52 C 4,290,045
52 H 4,290,044
63 4,290,046
134 4,290,047
4,290,048
146.3 MA 4,290,049
347 DA 4,290,050
347 DD 4,290,051
365 C 4,290,052
384 E 4,290,053
4,290,054
518 4,290,055
538 4,290,056
539 4,290,057
566 4,290,058
624 4,290,059
638 4,290,060
712 4,290,061
721 4,290,062
723 4,290,063
4,290,064

870.43 4,290,065

CLASS 343

12 R 4,290,067
17.1 R 4,290,066
702 4,290,068
722 4,290,069
788 4,290,070
819 4,290,071

CLASS 346

1.1 4,290,072
75 4,290,073
4,290,074
76 PH Re.30,743
154 4,290,076

CLASS 350

3.71 4,289,371
3.83 4,289,372
96.16 4,289,373
96.20 4,289,374
96.23 4,289,375
99 4,289,376
169 4,289,377
174 4,289,378
292 4,289,380
320 4,289,381
331 R 4,289,382
334 4,289,383
392 4,289,384
419 4,289,379
468 4,289,385

CLASS 351

128 4,289,386
159 4,289,387

CLASS 354

25 4,289,388
31 4,289,389
187 4,289,390
219 4,289,391
225 4,289,392
293 4,289,393
299 4,289,394

CLASS 355

3 BE 4,289,395
45 4,289,396

CLASS 356

5 4,289,397
73.1 4,289,398
226 4,289,399
305 4,289,401
313 4,289,402
349 4,289,403
351 4,289,404
376 4,289,400
407 4,289,405
429 4,289,406

CLASS 357

41 4,290,077
4,290,078
71 4,290,079
81 4,290,080

CLASS 358

4 4,290,081
8 4,290,082
88 4,290,083
260 4,290,084
264 4,290,085
293 4,290,086

CLASS 360

33 4,290,087
66 4,290,088
72.1 4,290,089
4,290,090

CLASS 361

228 4,290,091

CLASS 362

61 4,290,092
98 4,290,093
145 4,290,094
191 4,290,095
223 4,290,096
264 4,290,097
267 4,290,098
352 4,290,099

CLASS 363

60 4,290,100
65 4,290,101

CLASS 364

200 4,290,102
4,290,103
4,290,104
4,290,105
4,290,106
431 4,290,107
480 4,290,108
481 4,290,109
500 4,290,110
768 4,290,111
822 4,290,112
900 4,290,113
4,290,114
4,290,115
4,290,116

CLASS 365

15 4,290,117
183 4,290,118
189 4,290,119
205 4,290,120
227 Re.30,744
233 4,290,121
234 4,290,122

CLASS 366

75 4,289,407
76 4,289,408
83 4,289,409
88 4,289,410

CLASS 367

13 4,290,123
18 4,290,124
87 4,290,125
93 4,290,126
123 4,290,127

CLASS 368

1 4,290,128
66 4,290,129
71 4,290,131
200 4,290,130

CLASS 369

45 4,290,132
72 4,289,316

CLASS 370

85 4,290,133
92 4,290,134
110 4,290,135

CLASS 371

24 4,290,137
25 4,290,136
29 4,290,138

CLASS 375

14 4,290,139
46 4,290,140

CLASS 400

126 4,289,411
171 4,289,412
196 4,289,413

CLASS 403

12 4,289,414
104 4,289,415
146 4,289,416
218 4,289,417
369 4,289,418

CLASS 404

6 4,289,419
35 4,289,420
106 4,289,421
124 4,289,422

CLASS 405

61 4,289,423
179 4,289,424
210 4,289,425
259 4,289,426
260 4,289,427

CLASS 406

39 4,289,428
105 4,289,429

CLASS 408

1 R 4,289,430
154 4,289,431
201 4,289,432

CLASS 409

29 4,289,433
177 4,289,434

CLASS 411

34 4,289,060
4,289,061
4,289,062
187 4,289,181
451 4,289,058
531 4,289,059

CLASS 414

39 4,289,435
76 4,289,436
119 Re.30,742
315 4,289,437
412 4,289,438
523 4,289,439
4,289,440
589 4,289,441
629 4,289,442
748 4,289,443

CLASS 415

3 4,289,444
113 4,289,445
174 4,289,446
200 4,289,447

CLASS 416

140 4,289,448
185 4,289,449
192 4,289,450

CLASS 417

40 4,289,451
222 4,289,452
269 4,289,453
300 4,289,454
332 4,289,455
364 4,289,456
424 4,289,457
464 4,289,458
475 4,289,459

CLASS 418

78 4,289,460
84 4,289,461

CLASS 422

24 4,289,728
144 4,289,729
178 4,289,730
206 4,289,731
224 4,289,732
227 4,289,733
272 4,289,734

CLASS 423

136 4,289,735
158 4,289,736
228 4,289,738
245 4,289,737
306 4,289,739
328 4,289,740
376 4,289,741
450 4,289,742
4,289,743
579 4,289,744
594 4,289,745
633 4,289,746

CLASS 424

1 4,289,747
4,289,748
28 4,289,749
33 4,289,750
35 4,289,751
47 4,289,752
48 4,289,753
52 4,289,754
4,289,755
101 4,289,756
120 4,289,757
132 4,289,758
177 4,289,759
181 4,289,760
240 4,289,761
242 4,289,762
243 4,289,763
4,289,764
246 4,289,765
4,289,766
4,289,767
247 4,289,768
248.54 4,289,770
248.56 4,289,769
249 4,289,771
250 4,289,772
4,289,773
4,289,774
251 4,289,775
253 4,289,776
258 4,289,777
263 4,289,778
4,289,779
267 4,289,780
4,289,781
273 B 4,289,782
273 R 4,289,783
274 4,289,784
279 4,289,785
312 4,289,786
329 4,289,787

CLASS 425

8 4,289,462
47 4,289,463
66 4,289,464
111 4,289,465
112 4,289,466
141 4,289,467
146 4,289,468
302.1 4,289,469
336 4,289,470
373 4,289,471
415 4,289,472
567 4,289,473

CLASS 426

61 4,289,788
4,289,789
93 4,289,790
139 4,289,791
241 4,289,792
491 4,289,793
660 4,289,794

CLASS 427

3 4,289,795
39 4,289,797
4,289,798
65 4,289,799
68 4,289,800
94 4,289,801
125 4,289,802
134 4,289,803
135 4,289,804
140 4,289,805
150 4,289,806
195 4,289,807
209 4,289,808
230 4,289,809
4,289,810
239 4,289,811
379 4,289,812
385.5 4,289,813
4,289,814

CLASS 428

35 4,289,815
4,289,816
4,289,817
43 4,289,818
57 4,289,819
125 4,289,820
172 4,289,821
212 4,289,822
245 4,289,823
288 4,289,824
407 4,289,825
418 4,289,826
423.4 4,289,827
425.9 4,289,828
469 4,289,829
475.8 4,289,830
515 4,289,831
542 4,289,832
544 4,289,833
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281 4,289,844
296 4,289,845
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389 4,289,847

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136 4,289,852
177 4,289,853
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CLASS 518

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CLASS 521

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CLASS 525

104 4,289,859
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CLASS 526

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CLASS 548

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CLASS 564

20 4,289,903
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CLASS 568

315 4,289,909
367 4,289,910
396 4,289,911
422 4,289,912
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567 4,289,914
609 4,289,915

CLASS 570

209 4,289,916

CLASS 585

359 4,289,917
422 4,289,918
664 4,289,919

CLASSIFICATION OF DESIGNS

D2—	190	260,695			260,716		57	260,737		185	260,759	D19—	61	260,779
D3—	30	260,696		191	260,717		71	260,738		317	260,755	D20—	10	260,780
	32	260,697		234	260,718		83	260,739	D13—	10	260,760		22	260,781
		260,698	D7—	60	260,719		96	260,740		23	260,761		42	260,782
	65	260,699		70	260,720		106	260,741		41	260,762	D21—	13	260,783
	74	260,700		87	260,721		109	260,742	D14—	10	260,763			260,785
D6—	9	260,701		104	260,722		126	260,743			260,764		27	260,784
	20	260,702		108	260,723	D11—	43	260,744		15	260,765		82	260,786
	22	260,703	D8—	12	260,724		48	260,745		25	260,766		83	260,787
	24	260,704		51	260,725		81	260,746		53	260,769		87	260,788
	64	260,705		57	260,726		131	260,747		68	260,770			260,789
	75	260,706		72	260,727		133	260,748			260,771		108	260,790
	99	260,707		101	260,728		146	260,749		100	260,767		109	260,791
	144	260,708		331	260,729		153	260,750			260,768		131	260,792
	146	260,709		356	260,730		155	260,751	D15—	29	260,772		147	260,793
	149	260,710	D9—	307	260,731		157	260,752	D16—	25	260,773		150	260,794
	177	260,711		349	260,732	D12—	32	260,753		127	260,774			260,795
		260,712		367	260,733		54	260,754	D17—	18	260,775		196	260,796
		260,713		373	260,734		146	260,756	D18—	7	260,776		228	260,797
	179	260,714		447	260,735		158	260,757			260,777		249	260,798
	186	260,715	D10—	46	260,736		180	260,758		22	260,778	D22—	1	260,799

	13	260,800												
	18	260,801												
		260,802												
		260,803												
	25	260,804												
	27	260,805												
	28	260,806												
D23—	34	260,807												
	35	260,808												
		260,809												
	44	260,810												
D24—	10	260,811												
		260,812												
	21	260,813												
	24	260,814												
	29	260,815												
	31	260,816												
	58	260,817												
	99	260,818												
D25—	33	260,819												

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PATENTS

01 :	4,288,897		4,289,306		4,290,065		4,290,061		4,289,189		4,289,096
	4,289,445		4,289,315		4,290,076		4,290,130		4,289,197		4,289,154
	4,289,966		4,289,317		4,290,077		4,290,139		4,289,207		4,289,414
04 :	4,288,878		4,289,323		4,290,078	10 :	4,288,999		4,289,246		4,289,619
	4,288,954		4,289,324		4,290,083		4,289,464		4,289,250		4,290,018
	4,288,955		4,289,341		4,290,085		4,289,480		4,289,251		4,290,095
	4,289,010		4,289,361		4,290,087	12 :	4,288,879		4,289,269	20 :	4,289,587
	4,289,050		4,289,367		4,290,093		4,288,911		4,289,330		4,289,751
	4,289,142		4,289,381		4,290,100		4,288,935		4,289,337	21 :	4,288,995
	4,289,245		4,289,384		4,290,102		4,288,962		4,289,338		4,289,133
	4,289,355		4,289,417		4,290,106		4,288,990		4,289,351		4,289,302
	4,289,564		4,289,419		4,290,114		4,288,996		4,289,468		4,289,411
	4,289,662		4,289,436		4,290,115		4,289,041		4,289,472		4,289,412
	4,289,713		4,289,451		4,290,122		4,289,132		4,289,473		4,289,569
	4,289,927		4,289,452		4,290,123		4,289,137		4,289,505		4,289,666
	4,289,982		4,289,459		4,290,140		4,289,141		4,289,524		4,289,670
	4,290,006		4,289,491	08 :	4,288,901		4,289,215		4,289,530		4,289,729
	4,290,066		4,289,515		4,289,335		4,289,219		4,289,554		4,289,811
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05 :	4,288,940		4,289,557		4,289,529		4,289,264		4,289,625		4,289,127
	4,289,259		4,289,563		4,289,816		4,289,413		4,289,630		4,289,210
06 :	Re.30,744		4,289,568		4,289,973		4,289,446		4,289,644		4,289,421
	4,288,880		4,289,573		4,290,055		4,289,583		4,289,671		4,289,477
	4,288,886		4,289,574	09 :	4,288,917		4,289,609		4,289,675		4,289,532
	4,288,891		4,289,598		4,288,953		4,289,719		4,289,800		4,289,606
	4,288,894		4,289,608		4,288,979		4,289,749		4,289,835		4,289,631
	4,288,916		4,289,610		4,288,983		4,289,809		4,289,870		4,289,655
	4,288,922		4,289,615		4,289,013		4,289,917		4,289,874		4,289,673
	4,288,927		4,289,616		4,289,070		4,289,977		4,289,931		4,289,807
	4,288,930		4,289,634		4,289,119		4,290,031		4,289,934		4,289,862
	4,288,974		4,289,648		4,289,191		4,290,032		4,289,994	23 :	4,289,079
	4,288,982		4,289,653		4,289,307		4,290,138		4,290,011		4,289,469
	4,288,998		4,289,701		4,289,319	13 :	4,289,082		4,290,016		4,289,821
	4,289,017		4,289,714		4,289,383		4,289,343		4,290,056	24 :	4,289,016
	4,289,055		4,289,726		4,289,395		4,289,558	18 :	4,288,944		4,289,057
	4,289,069		4,289,747		4,289,460		4,289,724		4,289,131		4,289,097
	4,289,071		4,289,758		4,289,484	17 :	4,288,887		4,289,213		4,289,556
	4,289,092		4,289,812		4,289,486		4,288,910		4,289,504		4,289,629
	4,289,122		4,289,882		4,289,516		4,288,915		4,289,692		4,289,677
	4,289,138		4,289,909		4,289,570		4,288,949		4,289,695		4,289,748
	4,289,147		4,289,922		4,289,580		4,288,961		4,289,722		4,289,791
	4,289,152		4,289,979		4,289,613		4,288,994		4,289,766		4,289,808
	4,289,155		4,289,980		4,289,650		4,289,006		4,289,773		4,289,969
	4,289,212		4,289,993		4,289,702		4,289,019		4,289,778		4,290,035
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	4,289,234		4,289,999		4,289,712		4,289,029		4,289,787		4,288,926
	4,289,235		4,290,000		4,289,754		4,289,047		4,289,988		4,288,946
	4,289,244		4,290,014		4,289,755		4,289,090		4,290,004		4,288,989
	4,289,248		4,290,017		4,289,801		4,289,091		4,290,045		4,289,000
	4,289,258		4,290,020		4,289,879		4,289,167		4,290,057		4,289,015
	4,289,287		4,290,030		4,289,946		4,289,174		4,290,060		4,289,113
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DESIGN PATENTS

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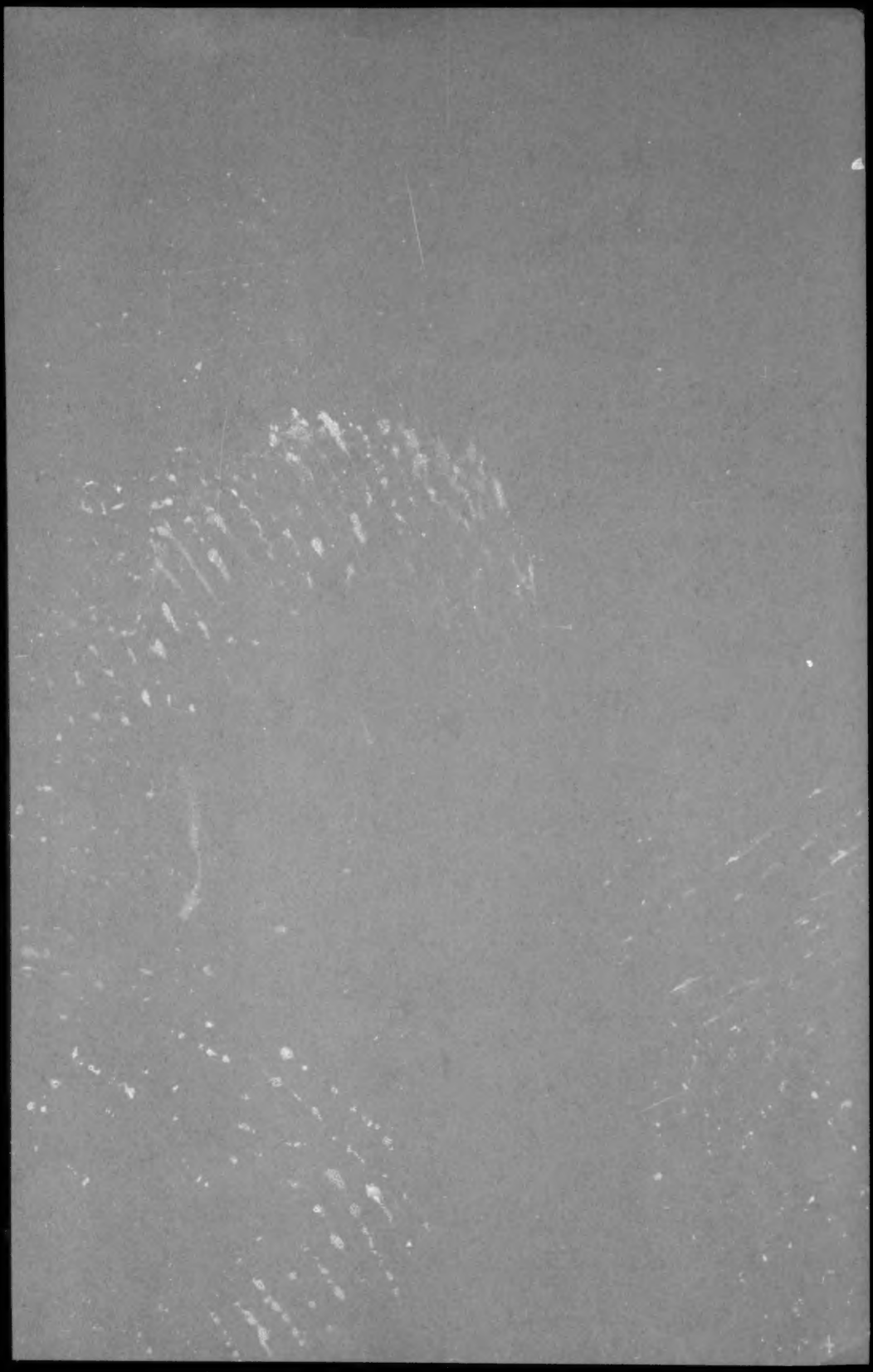

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